













**TRANSACTIONS**  
  
**OF THE**  
  
**AGRICULTURAL AND HORTICULTURAL**  
  
**SOCIETY OF INDIA.**

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**VOL. I.**

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**CALCUTTA :**

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**1838.**



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the fingers, and extirpating them with an instrument named *Kurpee*. The Castor Oil plant on account of the oil, which is used for burning and other purposes, is extensively cultivated at Allahabad; also tobacco, and some delicious species of melons, and a great variety of other vegetables.

11th. Waste lands are brought occasionally into cultivation, but no attempt, I understand, is ever made to improve land. I have no idea of the extent in which waste land exists. Embankments are not found necessary in this part of the country.

12th. The country around Allahabad is exceedingly fertile after the rains, and from October to March. Some of the fields are enclosed, but for the most part the lands are mixed, being only separated by means of a stone, or some other landmark. Drains are cut when the rains are heavy for the purpose of allowing the superabundant moisture to escape from the fields.

13th. Manure is made use of, and consists of the different kinds of filth, which are procurable in the city and adjacent villages. It is purchased from *mehturs* and others, at the rate of four or five carts for the rupee. Twelve or fourteen carts are reckoned in general sufficient for one bigha. The mode of manuring is by opening the ground with the plough to the extent of six or eight inches, then placing the manure in the furrow, and afterwards mixing it with the soil. This is practised annually before the *Rubee* harvest. The ground is manured anterior to the sowing of the *Kureef*, by admitting sheep to remain during the night in the fields, the dung of which animals it appears is reckoned particularly fine.

14th. No land in this district is cultivated, I understand as grass land for the food of cattle; but such lands as are deemed unfit for producing *Kureef* or *Rubee*, are allowed to run waste, and then cattle are turned loose into those fields for the purpose of eating the grass and herbs which spontaneously make their appearance. Grass is never dried for the purpose of making hay, but a large kind is much prized being employed for thatching bungalows and huts.

15th. Gardens are cultivated in the neighbourhood of Allahabad in which many of the productions of Europe are brought to very tolerable perfection. My garden, which is by no means the finest at the station, contains amongst others the following list of plants :

Lemons, Lime, Orange, Citron, Pomegranate, Pummelmuss, Figs, Lichees, Guavas, Peaches, Apples, Vines, Custard Apple, Papayas, Plantains, Jamuns, Jujubes, Mangoes, Lall Saug, Turraee, Pulwal, Sallad, Artichoke, Native Gooseberry, Onions, Garlic, Potatoes, Radishes, Water Cresses, Garden Cresses, Sage, Mint, Cucumbers, Cabbages, Cauliflowers, Baygoons, Pease, Pumpkins, Beans, Carrots, Parsley, Pinks, small flowers, Marygold, Myrtle, Jessamine, and Oleander.

The turnips, potatoes, pease, beans, cauliflowers, &c. appear to me as fine as in Europe, and might, I apprehend, be brought to any degree of perfection ; they flourish in the cold season. The Lichees are small ; Strawberries I have often attempted in vain to produce in the garden, the soil in this garden seems to disagree with them, but they come to fine perfection in the soft black soil near the Jumna. Turnips and onions are cultivated by Moosoolmans, as Hindoos from prejudices of caste refuse to eat them. The latter however eat potatoes, which I understand have been introduced by the English into this district, and were at first objected to on account of caste by the *Brahmins*. To my own taste some of the vegetables are bitter, and it is, I believe, generally remarked, that after the first year the produce of European seeds have a bitterish taste, but it seems to me that this could be remedied by cultivation ; and it is undoubtedly possible to improve the different kinds of garden vegetables in the manner they are improved in Europe.

16th. The chief orchards, which are raised in this quarter, are those of Mangoes and Jamuns ; there are several varieties of fruits. The mangoes are very fine, so are the custard apples, the melons absolutely delicious, the grapes are also good, the apples small and raised with difficulty,—

peaches grow with ease and no objection is made to eating them by any one. *Bela* fruit and mulberries also grow in the district. Grafting is known ; but no attempts are made by natives to introduce the cultivation of new plants.

17th. My information respecting the state of timber plantations is exceedingly limited. Mango trees, Tamarind, Maruca, Neem, Peepul, But, and a variety of others grow commonly. The Toddy tree and Date tree are likewise seen. The underwood is considered only useful for fuel, which is very scarce and valuable at Allahabad.

18th. The obstacles to agricultural improvement consist merely in the apathy of the natives, and the little regard paid to this subject by Europeans. Were the latter practically to commence improvement in the cultivation of land, and explain to the natives the principles upon which improvement proceeds and the advantages derivable from it, I am convinced a better system might with facility be introduced, and attended with incalculable benefit to every portion of the community.

19th. The comforts of the peasantry, or lower orders, in this district, as far as can be judged from external appearance, are extremely few. Their houses are uncomfortable in the utmost degree, and the appearance of their persons in many instances is that of squalid wretchedness and extreme poverty. Great numbers of beggars, filthy in their dress, if a few dirty rags deserve that name, and often even without a vestige of clothes, wretchedly meagre and poverty-struck in their aspect, are seen in the streets of Allahabad. In every part of the city amid the remains of former grandeur, are now visible only mud huts of the most pitiful kind, and even those are seen in ruin ; and when huts become dilapidated by the rains no attempt seems ever made to remove the ruined walls, or build other habitations in the place of those that have fallen. In consequence of this unaccountable neglect and idleness, the streets every where present the aspect of a dilapidated and fallen city, instead of a flourishing metropolis, worthy of being the capital of a fine country, and

situated in perhaps the most advantageous spot for inland commerce discoverable in Hindoosthan. The remarks now made, apply to every village and town I have seen in the district; want of comfort, ruin, and filth in the houses and streets, apathy, ignorance, and indolence in their inhabitants, are the distinguishing characteristics of the towns and their population.

This deplorable state of things, there can be no doubt, is owing to the unrestrained rapacity of the higher classes of natives, the laxity, or rather total absence of municipal regulations, and the ignorance, apathy, and indolence of all classes. It must therefore continue and increase, to the great injury of the country and the detriment of the public revenue, until *European* exertion be allowed to have its due weight in the country, and Europeans be permitted to give full scope to the energies of their intellectual endowments and corporeal activity, under due regulations, in a channel of proper direction. The reasoning by which I have been led to form this conclusion is as follows:—Wherever a European, with the means of livelihood is found in this district, he is invariably seen surrounded with natives who make of him an easy and fertile source of existence for themselves and families; and those who are in the service of Europeans, are constantly discovered in possession of means of livelihood, while others of the same class are perhaps starving. Suppose for instance a person's establishment comprehends upwards of twelve servants, each of whom has generally more than four others depending upon him for support, one European upon a very limited salary will be found to give bread to upwards of 50 persons, who but for his service, would be destitute of the means of subsistence. Two cotton screws are at this place in the possession of a European; when those screws are in work, not less than from one to two hundred people receive employment, and possess the means of existence, who are perfectly destitute and devoid of any other source of livelihood, that is to say, unless they can procure work as coolies some where else. It cannot,



therefore, I think admit of dispute, that since the natives themselves contribute so little towards the support of the mass of the lower orders, were the numbers of Europeans increased at every station, and those allowed to take their due interest in the country, by possessing land of their own, and establishing independent manufactories, such a system would speedily tend to the amelioration of the present distressing state of things, and add very much to the security of the Company's Government and the augmentation of their revenues.

III.—*Memorandum of Wheat cultivated along the course of the river Jumna on both sides.* By Major-General HARDWICK.

KUTEEA, FROM BUNDELKHUND.

This wheat is sown between the 25th September and 10th of October following, on lands within the rise of the river Jumna in the periodical rains, when the waters have retired within their banks for the last time in the season. The soil is once ploughed only, and sown in furrows, the first plough, which forms the furrow, is followed by a man who scatters the seed, and a second plough follows the first, and in forming the next furrow, turns the mould over into the first. It is next rolled to settle the earth, and the seed is then left to its fate, and the husbandman trusts to occasional showers and night dews for bringing the crop to maturity. The crop is generally fit for reaping by the middle of March; it grows to the height of from five to six feet in favourable situations, and within the inundations of the Jumna in particular, a great deal of this wheat is cultivated.

The same cultivation extends to lands inundated by other rivers of Bundelkhund and peculiarly favourable to this description of wheat. On the higher lands, where the soil is sandy, it is sometimes cultivated, but it must then be brought to maturity by the aid of irrigation.

The flour produced from this grain is of a reddish cast, but the natives esteem it highly nutritious and easy of digestion.

DAOUDY OR DESEE.

This is the common Wheat in cultivation in all parts of the Dooab. The better sort is not just now to be had in the market. I believe however there is no other difference between *Awul* and *Doem* than what is occasioned by cultivation.

12th May, 1821.

THOS. HARDWICK.

IV.—*Mr. Stirling's Replies to the Queries.*

TO DR. W. CAREY,

*Secretary to the Agricultural Society.*

SIR,

I have been favoured with your letter and have the pleasure to forward to you the information I have, (small as it is) with regard to the objects to which you have done me the honor to request my attention. Some of the questions being of too refined a nature, and supposing a greater degree of dexterity and improvement in agriculture than what exists in this or in other districts contiguous to the Nurmuda, I have been obliged to omit them and leave them unanswered.

1st Q. What is the distinguishing character of the climate in the district where you reside? This inquiry refers particularly to its dampness or dryness, and the prevailing degree of cold or heat, also to its being sheltered, or exposed, and the effects of these circumstances upon the productions of the soil?

A. This climate is dry. It is by no means singular for excessive heat or cold. It begins to be cool from the commencement of the rains which continue to the beginning of March, when the heat becomes very powerful. The district is sheltered on the North and South by ranges of hills; on the former by the hills which skirt the Nurmuda, and on the

latter by the hills which are topped by the Mahadeva hills and form an inferior range, it is open on the West, from which quarter the wind invariably blows, unless on the approach of rains and storms when it shifts to other points of the compass without constancy. It is likewise protected by certain hills on the East. This situation I conceive very favourable to its productions as it receives the most wholesome and healthy wind, whereas the East, the most pernicious, is excluded, and the South and North are shut out by the hills on either side.

2nd Q. What is the nature of the soil, is it argillaceous, calcareous, or sandy? What the substrata, what its elevation, whether it contains low swamps, fertile plains or hills, and if it be mountainous, what the elevation of the hills, and their fitness or unfitness for agricultural purposes?

A. The soil is I think calcareous in its nature, when wet it is impossible to walk upon it as it sinks very much, perhaps four inches by the weight of an ordinary man; on the contrary, when dry it is hard, and having received the heat of the sun one month or less it becomes cracked, and these cracks, together with holes that are formed during the rains, make it unpleasant to ride upon.

*Dessilit omne solum penetratque Tartara rimis.*

*Lumen et infernum terret cum conjuge regem.*

The substratum of this black rich soil is of a white muddy colour, firm, and quite different from the upper stratum; it has a good deal of sand in its composition, and a great deal of limestone. From the bottom of the Southern hills to the banks of the Nurmuda, the district is one large and extensive plain, and in the months of January and February, a complete and almost uninterrupted sheet of fertility, of the finest and most luxuriant crops. I am unable to give any correct information of the elevation of the district or the hills which invest it on the three sides, but I have reason to believe that it is several hundred feet above the level of the sea: the hills are of course higher in proportion. The portion of the hills comprehended in this district, is well cultivated and

contains many valleys which are not inferior to the plains in richness.

**3rd Q.** What are the facilities for disposing of the produce? Is there a facility of water carriage from the remote parts of the district to the larger towns, or must the produce be conveyed by land carriage?

**A.** The difficulties of disposing of the produce are great, as every thing depends upon land carriage, which, although at all times expensive, is frequently rendered still more so by the demand not being supplied. Jubbulpoor, Nagpoor, and Saugur are the chief markets to which the grain of the district is carried, and Mirzapoor is supplied with its cotton.

**6th Q.** Is there any regular system of irrigation, and if so, to what extent is it carried, whether merely to land cultivated with rice, or to grass lands and those cultivated with other articles of produce?

**A.** A species of irrigation prevails, which is extended not merely to rice lands, but it is found favourable in the production of wheat crops; indeed one field of this description often produces two crops, the one of rice, the other of wheat or gram; a field of large dimensions, has a bank thrown up on every side, which keeps in the water, when the rain falls. The field thus becomes soaked, and in a measure manured, by the end of the rains; on being merely scratched with a plough, and the seed thrown in, the finest crop is produced, with comparatively little labour and expense. There are very few instances, and (those only in gardens which produce some of the commonest vegetables) of wells being used in the culture of the land, the Persian wheel however is resorted to in these cases.

**9th Q.** What are the usual implements used in husbandry, and have any attempts been made to improve those in common use, or to introduce others more effectual? Do you know of any public spirited men of property who would be likely to make experiments on their estates with improved implements?

**A.** There are two sorts of ploughs employed, one used

vertically, the other horizontally, the former for cutting stubble and weeds, the latter for turning up the soil, after it has been cleared of the forementioned obstructions. The grain when ripe is cut with a sickle, and winnowed after it has been separated from the sheaf by being trodden under the feet of bullocks : I am not aware that any attempt has been made to improve those implements in common use, or to introduce others more effectual. There are no doubt many men who would have no objection to make experiments with improved implements provided they were satisfied that they should derive benefit from the trial.

10th Q. What is the state of cultivation, what the different articles cultivated, and to what extent respectively ? What is the season for sowing, and reaping the different crops ? Is there any alternation of crops, and what is the rotation usually observed ? Are the fields kept clean from weeds, and by what method ?

A. The lands are well cultivated and produce the following articles : Wheat, Rice, Gram, Musoor, Moog, Jooar, Teel, Urur, Rehur and Cotton. Wheat and gram are sown in nearly equal proportions ; Musoor in less than either, these three compose generally the winter crop. In the hills, beside these, two other species of articles called Koda Kootkee are sown at the commencement of rains ; the cultivation of cotton is increasing ; about 30,000 maunds were produced and exported this year. There are two harvests, the one after the rains, the other commencing about the middle of February and, when late, the beginning of March, as in Hindoostan. The natives are not perfectly aware of the good derived from an alternation of crops ; experience has however taught them to sow wheat only in the finest soil, reserving gram for the less fertile : Koda Kootkee are often sown in new soils preparatory to sowing gram. Gram is supposed to improve the soil and at last to make it capable of producing wheat in the rainy season. The fields are weeded with a small hand instrument fit for rooting up the weeds. Weeding is used especially where cotton or Jooar is sown.

It is found unnecessary in the winter crops, as the weeds do not then spring with the same exuberance, as they do in the rainy season.

11th Q. Are any attempts made to cultivate waste lands and to improve land in general? What is the quantity of waste land within the district where you reside, and of what description is it? Are embankments carried on to any extent, and what is the method usually employed in making them?

A. There is very little waste land if any in the district; there are many villages not fully cultivated. The only attempt to improve the land is by the species of irrigation above mentioned, much money is expended in some parts of the district in throwing up banks of earth, the retention of water is supposed to improve the land and to save expense.

12th Q. What is the state of the country around you? Are the farms enclosed, or are the lands of different tenants intermixed in open fields; is any attention paid to draining, and what are the methods employed to clear the lands of superabundant moisture?

A. The country immediately around is quite a plain, intersected now and then with ravines, near to which is always some bed of a nulla, into which the waters are carried in the time of the rains. The months of December, January, and February present most beautiful cultivation extending without interruption as far as the eye can reach; every village is surrounded with a quantity of trees, forming as it were, a tuft in which the village is placed. There are few or no trees in the space between villages, that ground being completely covered with crops of corn. The farms are not enclosed. In riding for many kross at this season of the year, (the end of June,) you would find scarcely one field enclosed. The lands of different tenants and zemindars are therefore intermixed in open fields. No attention whatever is paid to draining, as it is not required in such a country as this, where the superfluous moisture is carried off by small nullas.

13th Q. Is any system of manuring observed? What

are the kinds of manure employed, in what state are they put upon the land, and in what quantities to the *biga*?

A. No sort of manure is used in this district, such a system being entirely unknown and almost unrequired.

14th Q. Is any, and what proportion of the lands in your district employed as grass land, and of what kind? Is it upland, or meadow? Are any attempts made to cut and convert the grass into hay? What are the facilities for improving grass land, making hay, and applying that kind of produce more effectually to the feeding and improvement of stock?

A. A certain quantity of the ground attached to a village, is frequently employed as grass land; but no calculation as to the proportion can be made. In the hills a greater quantity of grass is produced and is cut down and converted into food for cattle; it is likewise used for covering huts. The method of making hay as practised in England, is not known; however, meadow land produces very sweet grass and is used for feeding the cattle. It is seldom cut till it has become dry and consequently loses much of its qualities by having been uncut when in a moist and green state.

15th Q. Is there any disposition in your part of the country to cultivate gardens, either for use or ornament? and to what extent can any of the productions of Europe be brought to perfection? Do those plants which are common in Europe thrive with you in the rainy season? Do Beans, Peas, Cabbages, Cauliflowers, Turnips, and other European productions perfect their seeds, and retain their qualities, or do they degenerate? Is it not possible to improve the various sorts you have in the manner they are improved in Europe?

A. There is no disposition whatever to cultivate gardens; this amusement is even less resorted to than in the Dooab, Agra, or Bareilly districts. Beans, Peas, Cabbages, Cauliflowers, Turnips, I have reason to believe would perfect their seeds in this country. In the Saugor district seven days' march north of this, these productions perfect their seeds

and arrive at a great degree of perfection, Peas, Cabbages and Cauliflowers may be had without difficulty for nine months in the year. I believe indeed, that peas are often reared in the rains, but they require more attention and care at that season than at any other.

16th Q. Is any attention paid to orchards? What are the principal fruits cultivated? what attention is paid to the improvement of them by grafting, budding, or raising new varieties from seeds? Are any attempts made to introduce new species or varieties from other countries?

A. As the natives have no disposition to cultivate gardens, they likewise pay no attention to orchards.

17th Q. What is the state of Woods, or of Timber plantations? Have any new plantations of useful Timber been made, and what has been the method pursued? What are the usual Timber trees in the district, and what the species which may be cultivated to most profit? Is the underwood considered as valuable, or thrown away as useless?

A. Upon this query I may be allowed to inform you, that Ebony is obtainable, as likewise Teak on the borders of this district, and also a most valuable wood called *Shishoo*, a very hard reddish black sort of wood, heavy in weight, and bears a most beautiful polish. The hills are well wooded; but the best wood is only to be had by going into the neighbouring district of Chundwara. The other parts of the question of course I must leave unanswered, as no plantations exist, and wood is not considered of any value: he who takes the trouble to fell a tree claims that tree as his property.

18th Q. What do you think are the obstacles to agricultural improvement? and what do you suggest as the most appropriate remedies to them?

A. I am unable to suggest remedies, as I am not aware that there exist at present any material defects in agriculture of such an obvious nature that the native could easily correct them.

19th Q. In what manner do you think the comforts of the peasantry around you could be increased, their health better secured, and their general happiness promoted.



A. The comforts of the peasantry would no doubt be increased by securing to each individual his own proper income after he has discharged whatever claims the Government might have had upon it. They require to be protected in many instances from the oppressions often exercised upon them by their landlords. After they have been secured in their property and persons, their health and happiness must depend, I conceive, principally on themselves.

20th Q. In what manner do you suppose useful knowledge on these subjects may be best obtained and diffused ?

A. The best manner in which useful knowledge on these subjects, may be obtained and diffused is, in my opinion, that which has been already adopted by the Society. The diffusion of agricultural information will be, I should imagine, far more rapid, than its collection. To the Agriculturist, every improvement supplies an immediate and new fund of wealth ; he is enabled to make the soil bring forth its produce at a less expense, either by the reduction of labour or by the increase and abundance of his crops ; in some instances, his income may be increased by the introduction and rearing of some new species of grain and new articles of produce which perhaps formerly may have been imported from other countries, at an enormous expense. To the Horticulturist also every improvement is an acquisition to his pleasures and his table ; every tree, every plant, every vegetable, and every fruit of a new species, or only grown in a distant climate, which he is able to bring to perfection in his own garden, must give unspeakable satisfaction. The soil of his garden must particularly demand his notice, and any method that is pointed out by which it can be meliorated, will no doubt be eagerly pursued by him. What in the world affords such a continued and inexhaustible fund of amusement, such innocent pleasure and delight as the rearing of a garden ? The greatest men of ancient and of modern times have striven to improve their gardens into paradises, and have often appeared more dignified and better men in this occupation, than they ever did when seated on their thrones, or in the exercise of their public offices.

As the natives are firm allies to their own interest, they will readily catch at every agricultural improvement. The simple routine of the agricultural labours of their forefathers, will yield to the more improved methods of modern times, when they find themselves rewarded by the adoption of the latter and the relinquishment of the former. The enterprising will first enter the path of advancement, and the more prudent will quickly follow their footsteps. In the education of adults in Europe it appears to be a new and much approved method to combine agricultural occupations with mental acquirements. As this mode of education seems to me to exhibit bright prospects of diffusing useful information on agricultural subjects, I make no hesitation in naming the famous and much celebrated school at Hofwyl in Switzerland as a proper model for any schools which may be hereafter instituted in this country, in the establishing of which the Society may possess sufficient influence. If such a mode of education should be successfully introduced, I apprehend the advantages would be manifold. I cannot conceive any measure which would tend so much to the production of universal improvement, as the diffusion of Agricultural and Horticultural knowledge among the native subjects of our Government. I shall only add the words of an advocate of this system of education in support of the above recommendation. "That one of the happiest thoughts the genius of utility ever suggested, was, that of rendering the labours of the field subservient to education, and placing a school at the tail of a plough."

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V.—*On a new mode of preserving Seeds.* By D. SCOTT, Esq.  
Cooch Behar, October 12, 1821.

DEAR SIR,

I beg to communicate to the Agricultural Society a mode of preserving garden seeds in a state fit for vegetation. It

consists in keeping them in a state of perfect dryness, by inclosing them in glass phials, previously half filled, with parched bran, charcoal properly prepared, or any other substance possessing the power of attracting moisture from the atmosphere.

I beg to forward as a specimen a phial containing some turnip seeds despatched from Scotland in March, 1820, and still capable of vegetating, although only in a partial degree, which, to the best of my recollection, was the case when they arrived nearly two years ago.

The bran or charcoal ought to be heated, the latter to redness under sand, and the former until it just begins to get brown, and to be allowed to cool in closed phials, after which the seeds are to be introduced and secured from the access of the air. It may also be useful to prevent sudden changes of temperature by keeping the phials in a box packed in cotton.

The bran or flour of any sort of grain will answer, all kinds I have tried gaining an addition of about 20 per cent. to their weight on exposure to the atmosphere after being parched, but I should, upon the whole, prefer charcoal, as the least liable itself to change, although it does not attract so much moisture as the other substances.

I remain,

Dear Sir,

Yours faithfully,

D. SCOTT.

P. S. I beg to observe that the seeds now sent were put up after being dried in January, 1821, with parched oatmeal, and had not been opened until the beginning of this month. The other seeds of various kinds despatched at the same time were sown last October, and succeeded perfectly.

VI.—*On a new mode of Grafting. By the President,  
W. LEYCESTER, Esq.*

*A short account of observations made on a mode of increasing plants of a given kind, which might not have been expected to be found in so remote a quarter, and of a mode of ingrafting which is supposed to be in some degree novel.*

I encamped at Mallaghur in the vicinity of a small mud fort, the residence of Nuwab Bahadur Khan, and situated about 20 miles south of Meerut, on the high road from Allighur. Bahadur Khan is well known in the Western Provinces as having been one of the native Sirdars engaged in the campaigns under Lord Lake, and for his active zeal in the improvement of the native breed of horses, and, generally, for his having adopted many of the ideas and habits of a European.

Among other things he had given his attention to Horticulture, and I went over his garden with much pleasure. I found in it a bed of small sweet limes which obviously had lately been small branches of older trees, and which I could only account for by supposing that they had been treated in, what I call, the Chinese method, by ringing the bark, and the application of a ball of earth kept moist, until roots shoot therein, when the branch is cut off and becomes an independent plant.

This is so common a practice here that it hardly seems worthy of notice, but it is not so common up the country, nor so easy of practice in a dry country, as to be met with in the garden of a native without some surprise.

I made a man pull up one of them forcibly, and found that it had been formed in the manner I had supposed, and, as might have been expected, and, that the roots shot from the upper lips of the ringed bark, which might not have been so readily looked for, from the lower lip also.

I inquired of the Nuwab on the subject, and learnt that he had a gardener who was experienced in the practice, and at \*

my request he a few months after sent me two gardeners, relatives of his own, who were in my service for several years. One at 12 Rs. per month, the other at 6 Rs. I found the head man most, perfectly experienced in all the different modes of engrafting, and pretending to a great many secrets touching compost and manures by which wonderful improvements were to be effected in our fruits. He was also in the habit of superintending the distillation of rose-water and collecting the essential oil or uttur. He had also a mode of engrafting which is not uncommon in the upper provinces, but of which I have never seen a printed account ; the communication of which is the principal object of this paper.

In the season of the year when the bark easily separates from the wood, having previously cut off the end of a small branch which was considered unripe, about a quarter of an inch above an eligible bud, he would then make an annular cut round the bark about half an inch below the bud, and then, with a cloth in his hand, would forcibly pull off the ring of bark, taking care not to injure the bud, after which he would proceed in the same way with the buds below.

Having collected a sufficient number and kept them fresh in the hollow of a leaf with a little water, he would proceed to the stocks to be engrafted, and having cut off the head, where the stock seemed of a proper size (a little less than the rings of bark in his possession) he would strip the bark in small shreds all round to a sufficient depth, until a ring of the bark being applied, very exactly fitted. The shreds were then collected over the ring of bark and tied above, and bound together by a little moist clay, taking care not to press upon the bud.

This perhaps combines the advantages of being the most successful, the most easy, and most simple mode of engrafting or budding.

I made many repeated inquiries from these people regarding the mode in which they acquired their information, thinking that they might have been instructed by a European, but they regularly asserted that their information had

been handed down in their family from a period beyond the memory of man; and I had no reason to believe that they practised any deception in that respect, which must have been void of all utility to them.

These men were *Mahomedans* and natives of the town of *Juypoor*, which is perhaps not without its share of singularity; the birth-place of a Mahomedan gardener of skill might have been looked for in every other part of India with more probability of success than in the zealous Hindoo town of *Juypoor*.

I do not expect by this little narrative to afford much information, but I am not deterred by any accumulated state of our records, from adding my small endeavour to put upon our proceedings that which seems to me not without some portion of interest.

8th September, 1821.

W. LEYCESTER.

VII.—*An account of the Agriculture of the 24-Pergunnas.*

By *Raboo* RADHA KANTA DEVA.

TO THE REV. W. CAREY,

*Acting Secretary to the Agricultural Society.*

SIR,

I embrace this opportunity to answer the printed letter, which you were pleased to send me some months ago, requiring thereby various information on the subject of Agriculture and Horticulture; asking your pardon first for the delay which has unavoidably taken place in transmitting this to you, as well as for my not being able to attend the meetings of the Agricultural Society at night, of which you were so good as to forward me due notices.

1st. The distinguishing character of the climate in the district of the Twenty-four Pergunnas is damp, and the cold and heat temperate. From the Bengal month of *Phalguna* to *Asarha*, the air and water are saline, and from *Sravana* to *Magha*, not impregnated with salt. The productions of the soil are moderate.

2nd. The nature of the soil of this district is various, the surface of some places is argillaceous, and below the surface calcareous, and that of other places, sandy with a stratum of muddy alluvium beneath it. It contains low swamps and fertile plains, but no hills.

3rd. The agriculturists dispose of the produce in the interior, and dealers carry the same to town. There is a great facility for conveying it from remote parts of the district to the larger towns by water carriage, but there is a facility of land carriage too from the interior of this district to the presidency.

4th. The rent for rice land is from 8 annas to 2 rupees per biga, for the upland from  $1\frac{1}{4}$  to  $1\frac{3}{4}$ , and for a homestead 2 or  $2\frac{1}{2}$  rupees, and the same place yields 3 or 4 Rs. a biga, more or less, according to the richness of the ground. The customary burdens, namely, Mathota<sup>1</sup>, Parvati<sup>2</sup>, Bhetee<sup>3</sup>, Marocha<sup>4</sup>, Chouth<sup>5</sup>, Salamee<sup>6</sup>, Bata<sup>7</sup>, &c. which the tenants formerly had to bear beside their rents, have been partly included in their jumma<sup>8</sup>, and partly abolished by the Government. The security of continuing tenants in the occupation of their farms, on paying their rents, is the Putta or lease, and Jumabundee or rent-roll. New tenants hold a Putta, a Sunud, an Amulnama, &c. as security for their occupation of the land, and execute agreements with the landlord.

5th. The general size of farms is uncertain, the tenants hold that quantity of land, (from 1 to 1000 bigas more or less,) which is entered in their respective names in the rent-roll, and cultivate it either by themselves, or jointly, or let it to their under tenants, on certain conditions and at a certain rate, and pay the rents for the same as fixed by such rental. When land is deserted by one tenant, it is let to another on a perpetual or provisional lease, for the former rent, or for an additional sum, as agreed on by the present lessee.

1 A pole tax. 2 A tax levied for worship at the full and new moon. 3 Presents. 4 Presents made at weddings. 5 A fourth part. 6 Presents to obtain favours. 7 Discount. 8 The assessed rent.

6th. The crops in this district being assisted by rain water, there is very seldom any necessity for irrigation; when necessary, water is obtained from a pond, creek, or river, by means of a bucket and carried to the seed plot, and to the lands cultivated with rice, or other articles of produce, but grass lands are not irrigated.

7th. The general arrangement of agricultural labours is as follows: rich and respectable husbandmen employ from four to ten servants or labourers from time to time, as necessary, and cultivate the lands in the proper season; poor husbandmen work themselves; the hours of their field labour are from morning till 12 o'clock, and from 3 in the afternoon till the evening, and their cattle work during those hours, the hours of their domestic labour depend upon their leisure. One biga of land in this district is calculated to be cultivated for one rupee, more or less, in a favourable season. 8 or 10 labourers, and 10 or 12 ploughs complete, are hired for a rupee per day.

8th. The kinds of live stock are cows, goats, buffaloes, sheep, asses, &c. the two former are reared more commonly than the latter. In this district two oxen are generally required to each plough during their daily labour, by which about 10 or 12 bigas of land are cultivated in the season. No attention is paid to the improvement of the breed of cattle. Dairies are common in places inhabited by cowherds or milkmen. About two seers of milk are yielded on an average by a cow, some cows give half a seer of milk, and others 5 or 6 seers; this, however, is uncommon. About one quarter of a seer or three and a half chuttaks of curd and cheese, one chuttak of butter, and three and a half kach-chas or quarters of a chuttak of ghee, are produced from a seer of milk. A certain quantity of the milk is boiled or curdled and made into sweetmeats with sugar for Hindoos. Cheese is made for Europeans in some parts of Bengal, but not in this district. Milk spontaneously coagulated by the heat, or by the addition of butter-milk, is churned and butter is obtained from it, which is first preserved in a vessel full



of water, and then in a dry pot; the same butter when clarified, or gently boiled and allowed to cool, becomes ghee. Sheep in this district are small in size, and have a small quantity of wool; a blanket-maker of Calcutta says that they get no more than 4 or 5 chhattaks of wool from each sheep. The fattening of cattle for slaughter is not attended to by Hindoos. The cattle are turned loose to get their food in the fields from Magha to Asarha, and while rice is growing, i. e. from Sravuna to Pousha, they are fed at home on grass cut for them, and on rice straw, and the husk of mustard seed formed into cakes, commonly called oil cake. Attempts are made sometimes to improve the breed of cattle by crossing them with males of larger breed.

9th. The usual implements used in husbandry are the langul or plough, kodalee or digging hoe, the nirance or weeding instrument, bida or rake, the mooi or harrow, kastya or sickle, &c. No attempts have been made to improve those in common use, or to introduce others more effectual. I do not know any men of property that would make experiments on their estates with improved implements; but I think they would be used by every body if cheap and effectual.

10th. There are three harvests in the year commonly called *khunda*, viz. *Chita* or *Hurit khunda*, the spring harvest; *Bhadra* or *Asoo khunda*, the autumnal harvest; and *Pousha* or *Himuntik khunda*, the winter harvest. The crops in this district are chiefly rice, of which a species called *Aoos* or properly *Asoo*\*, is produced in a smaller quantity, and that named *Amun*, in greater abundance and good. *Asoo* rice does not grow well in low swamps, but *Amun* rice does, the former is sown in the month of *Chitra* or *Visakha*, and reaped in *Sravuna* or *Bhadra*, and the latter is sown in marshes in *Phalgoona* or *Chitra*, planted in *Asarha*, or *Sravuna*, and reaped in *Ugruhayuna* or *Pousha*, as the season permits. *Asoo* rice produces on an average five, six, or seven bunds to the biga, and *Amun* eight or nine, more or less.

\* Early rice.

From two and a half or three maunds of paddy\* one maund of chaoor or rice for the table is obtained, after the husks are separated by the pedal. After reaping Asoo rice, some kinds of Amun called suroona and oatron, are sometimes sown in the same field, the first-mentioned ripens in *Ugrahayana*, and the last in *Kartika*. A great variety of pulse, namely, teora or khesaree<sup>1</sup>, musoor<sup>2</sup>, krishna mooga<sup>3</sup>, sursa<sup>4</sup>, musina<sup>5</sup>, yuva<sup>6</sup>, as well as dhunya<sup>7</sup>, mohuree<sup>8</sup>, ajwaen<sup>9</sup>, &c. are sown on the upland, in *Uswina* or *Kartika*, and reaped in *Magha* or *Phalgoona*. *Urhur*<sup>10</sup>, is sown in *Visakha* and reaped in *Phalgoona*; these articles produce on an average from a maund and half to two maunds and a half to the biga. *Pat*<sup>11</sup> is cultivated in *Visakha* and cut in *Bhadra*, and *suna*<sup>12</sup> in *Asarha* and *Bhadra*. Sugar-cane is cultivated in *Visakha* and used in *Magha*, *kuchoo*<sup>13</sup> and sweet-potatoes in *Visakha* and *Uswina*, tobacco in *Uswina* and *Phalgoona*; turmeric, onions, garlick, and ginger in *Visakha* and *Magha*, cotton in *Kartika* and *Jyistha*, and *putola*<sup>14</sup> in *Kartika* and *Magha*. These articles are produced once a year in uplands. *Baiguns*<sup>15</sup>, commonly called brinjals, *susa*, (cucumbers,) *phoo-tee*<sup>16</sup>, *laoo*<sup>17</sup> or calabashes, capsicum or red pepper, radishes, &c. are produced twice a year. Plantains, betle-leaf, betle-nut, coco-nuts, bamboos, &c. are perennial, but the stem of the plantain tree dies after yielding its fruit. The fields are kept clean from weeds with a rake and weeding instrument.

11th. Attempts are made to cultivate waste lands and to improve other grounds; but the quantity of waste land in the district, is a subject of reference to the records of the

\* A Malay name for unhusked rice. The Bengalee name is *Dhan* or *Dhanya*.

1 *Lathyrus sativus*. 2 *Cicer lens*. 3 *Phaseolus Max*. 4 *Sinapis dichotoma*. 5 *Linum usitatissimum*. 6 Barley, *Hordeum hexastychon*. 7 *Coriandrum sativum*. 8 *Pimpinella anisum*. 9 *Ligusticum Ajouan*. 10 *Cytisus cajan*. 11 *Corchorus olitorius*. 12 *Crotalaria juncea*. 13 *Arum colocasia*. 14 *Trichosanthes dioica*. 15 *Solanum melongena*. 16 *Cucumis momordica*. 17 *Cucurbita lagenaria*.

collector, who can probably give an account of it. Waste land consists chiefly of forest and pasture land, land set apart for receiving the carcases of dead cows, and some saline lands; the former has been gradually cultivated by individuals on leases obtained from the collector. Embankments are made to prevent salt water from getting into the rice fields, and they are occasionally cut open at places to bring and carry off water, that is to say, from *Ugruhayuna* to *Asarha* they are shut, and from *Sravuna* to *Kartika* open. The method usually employed in making embankments is, to collect a large quantity of mud in the dry season, and heap it up on the bank, a number of posts, mats, &c. are fixed in the water-course and filled up with earth and rubbish, during the ebb tide, the particulars of which may be known upon inquiring of the superintendents of embankments.

12th. The state of the country is nearly as before specified. The farms which are on uplands, are in some places enclosed with a mound or ditch, generally, however, the rice fields of different tenants are intermixed; but there are particular marks to distinguish them, viz. a crossing dike, a stake, a bunch of fragrant grass\*, &c. The method used to clear the land of superabundant moisture, is as mentioned in the preceding article.

13th. A system of manuring is observed. The kind of manure employed near Calcutta is principally rotten cow dung, and in other places, the earth of old mud walls, and mud dug out of ponds, and in the western part of the country human dung. The manure is carried about the field with baskets and then scattered about, ploughed and mixed with the soil. About half a maund of manure, more or less, is put on a biga.

14th. There is no land in this district employed as grass land, with the exception of a small quantity of pasture land, which is both upland and lowland. No attempts are made to cut and convert grass into hay; but grass-cutters go from Calcutta to the interior parts to cut grass. The advantage

\* *Andropogon muricatum*.

of improving land by cultivating grass, which is given green to the cattle, is unknown, unless that which produces *coloo*\*, the straw of which is used in thatching, be so reckoned; all, however, that is done to improve that grass, is nothing more than the burning of the standing parts of the grass annually. Hay is not used in feeding any cattle except horses, in places inhabited by Christians. Kine, &c. are fed with rice and straw, and graze in the fields from Magha to Jisthya.

15th. There is a considerable inclination in this part of the country to cultivate gardens for use and ornament, and the productions of Europe are brought to perfection; but whether they perfect their seeds, retain their qualities, or degenerate, is best known to those who have seen and tasted them both in Europe and India. I think it possible to improve the various sorts of indigenous fruits and plants, but do not know what methods are adopted for that purpose in Europe.

16th. Attention is paid to orchards. The principal fruits which are cultivated are, coco-nuts, betle-nuts, palmyra-nuts, pumplemusses, dates, mangoes, jaks or bread-fruit, rose-apple, jamba or eugenia, guava, pomegranate, pine-apples, jujubes, a great variety of limes, and plantains, peaches, lichees, &c. The rich pay attention to the improvement of some of them by grafting or raising new varieties from seeds, and they also attempt to introduce new species from other countries. The grafting of mango and jujube trees is now very common here.

17th. No industry is used to raise wood in this part of the country. No new plantation of timber has been made, nor is it usual to attempt it. The chief timber trees, or species of wood (which are on the south-east quarter of this district), are hintal, ahi, kesoor, kripa, guran, bani, keora, khulsee, gaon, soondree, &c. Planks cut from kantel or jak-tree are the best and those of mango, eugenia, jamboo, the simul or the cotton tree, &c. are inferior. The under-

\* *Saccharum cylindricum*.

wood is not considered valuable; it is thrown away occasionally.

18th. The obstructions to agricultural improvement are the calamities of the seasons, as excessive rain, drought, &c. and locusts, rats, birds, &c. The remedies usually employed to avert calamities of the seasons are religious ceremonies, and embankments to stop inundations. Precautions are taken against devouring animals and insects; and draining, irrigating, and manuring the lands for their improvement are much practised.

19th. The comforts and happiness of the peasantry will be promoted, if their professional business go on well, the produce of their lands be increased; and if they be not molested by their landlords, the public officers, and those connected with mercantile pursuits. Their health may be likewise secured by those means, and by preventing the coming in of salt water.

20th. Useful knowledge on these subjects may, I think, be obtained and diffused by communicating, corresponding, and associating with the collectors of land revenue, indigo planters, botanists, agriculturers, zemindars, and the descendants of the late kanoongos, and by collecting books or treatises on these arts in Sungskrit, Persian, and English, and turning them into such vernacular languages as may be deemed requisite.

I remain, with cordial wishes for the success of your benevolent and laudable exertions to improve the agriculture of India,

Sir,

Your most obedient servant,

RADHA KANTA DEVA.

*Calcutta, Sept. 18, 1821.*

VIII.—*An account of the cultivation of Joomla Rice, with a note thereon by the President.*

Rice from Joomla, a district in Nepal, situated N. W. from the great valley, adjoining to the Himalaya, and about six weeks journey from Katmandu. It was procured from thence by the intercession of Mr. Gardner through the court of Katmandu and was accompanied by the following memorandum.

“Mode of sowing and cultivating the rice commonly called Joomla Dhan. Take the quantity of grain you intend to sow and having collected it in a heap in any cool place, cover the heap entirely with layers of moistened earth and rich manure mixed together. In the course of ten or twelve days the grains of rice, that have been thus covered up, will sprout and send forth green shoots; when this takes place, they are ready for sowing. The ground on which you intend to sow, must be prepared as follows. It is to be plentifully covered with water and ploughed until the water has become well mixed with the earth. The grain is to be strewed upon the ground whilst in this saturated state, and it will assuredly thrive. Should it appear to require water afterwards, as the crop advances, water must be given at discretion.”

MY DEAR SIR,

The above is a description, and mode of cultivation of a variety of mountain rice, a box of which I have in charge to present to our Society in Dr. Wallich's name. I should have made this communication earlier, but have been prevented in various ways. My wish is to know if you can suggest any mode to make the communication useful, and wish for any as an experiment.

I do not see that it can be useful in our provinces south of the mountains.

Your's very sincerely,

W. LEYCESTER.

Sept. 19, 1821.

IX.—To the Rev. Dr. W. Carey, Secretary to the Agricultural Society.

SIR,

I do myself the pleasure to transmit for the information of the Agricultural Society some specimens of plants affected by the disease named *Kindool* by the natives, which annually attacks and destroys large quantities of *Bajra*. This year it seems more than usually prevalent, and is accidentally occasioned by moisture, the dews at present being very heavy and resting for several hours upon the plant, which is just coming into the ear.

This disease is obviously allied to smut, from which it however differs in several particulars, especially in the swelling of the *seed*, which is very analogous to the tumefaction attending inflammation in the animal body, which is not observed in the ears of barley affected with smut.

Although so prevalent I am not aware of any European having noticed this disease before myself, nor am I acquainted with any printed notice respecting it, besides that which is contained in my late publication on *Morbus Oryzeus*.

Should the Society deem this subject of sufficient importance to attract their attention it will afford me much pleasure to afford them all the information regarding it which it may be in my power to acquire.

I have, &c.

Allahabad, Oct. 9, 1821.

R. TYTLER.

X.—To the Rev. Dr. Carey, Secretary to the Agricultural Society.

SIR,

In addition to the specimens of *Bajra* affected with *kindool* despatched by a manglee a few days ago, I take the liberty to transmit an ear of the same plant affected with what is named by the natives *Banjeelo*; this irregular appearance is occasioned by the parts of fructification in the

plant being entirely destroyed by moisture proceeding from a fall of rain and heavy dews. I understand much of the *Bajra* is affected in this manner this year, and thinking that a specimen may prove acceptable to this Society, I have done myself the pleasure to transmit the inclosed ear, and beg to remain,

Your's, &c.

Allahabad, Oct. 12, 1821.

R. TYTLER.

**XI.—An account of a Dwarf Pea introduced from Patna, with a Specimen. By the President.**

[Read Jan. 23, 1822.]

I beg to lay before the Society a specimen of Dwarf Pea, introduced at Patna from English seed, I presume, within the last few years.

It will be found to be little if any thing inferior to the marrow-fat pea in size or flavour, and its merit will be shewn to be greatly superior by the following detail.

The specimen produced is from the remains of a first crop of which I did not note down the time of sowing, coming up, flowering and produce, but I sowed another crop on the 15th December. They were pretty well up on the 24th Dec. (I deem this a long time and ascribe it to the dryness of the soil,) were in blossom on the 14th January and in full blossom on the 16th, and well in pod this morning and will be ready for the table in a few days. The first crop come in on the 3rd or 4th of December, and I know I was very late in sowing them from want of hands, but I cannot fix on any date.

They have the further advantage of requiring no props, and as growing not more than a cubit in height, the lines may be much closer, and in the intervals may be sown, for a later crop, marrow-fat peas, which will not be high enough to annoy the Dwarf Pea before its produce is past, and this is of no little importance in a place where land and gold are so nearly on a par.

Jan. 24, 1822.

W. LEYCESTER.



XII.—*Dr. Tytler on Diseased Barley.*

MY DEAR SIR,

I take the liberty to transmit for the information of the Agricultural Society the enclosed specimens of diseased grain of the harvest at present ripening in this district.

1. The barley appeared to be ripening in the finest manner imaginable up to the 30th ultimo; on the 29th I examined the fields with care and could discover no sign of disease; on the night of the 31st, a tremendous storm of thunder and lightning occurred, accompanied with much rain, which has since continued at intervals, with the thermometer ranging between 60 and 70; the consequence was this formidable distemperature to the barley, which also occurred last year after heavy falls of rain. A similar disease is understood last year likewise to have injured the crops at the Cape of Good Hope and St. Helena. This destructive affection does not appear to me to coincide with any of the diseases of grain mentioned in Sinclair's work on Husbandry, Appendix No. XXXV. Vol. II.

2. This affection which appears closely to resemble the *blight* which occurs to the same grain in Europe, took place in the wheat, immediately after the rain that injured the barley, but that grain in *Híndoosthan* seems far less susceptible of injury from the weather than the barley.

3. This affection in the wheat is produced from white ants or other insects destroying the root, a considerable quantity of the grain seems injured in this manner this year.

Your's very truly,

R. TYTLER.

*Allahabad, 3rd February, 1822.*

**XIII.—Radha Kanta Deva on the Agriculture of Silhut, Rajshahce, and Dinajpoo.**

TO THE REV. W. CAREY,

*Acting Secretary to the Agricultural Society,*

MY DEAR SIR,

As the President of the Agricultural Society has, at the meeting held on the 20th March last, been pleased to inquire from me the particulars of Jumma of Silhut, I beg leave to state the same as follows. In the year 1784, the district of Silhut paid in annual revenue to Government the sum of sicca rupees 2,33,924; in 1787, the sum of sicca rupees 2,29,851 13; in 1788, the sum of sicca rupees 1,33,351 5 6 3; and in 1789, the sum of 8,44,325 kahuns of cowrees at the rate of five kahuns and ten puns to the rupee, being sicca rupees 1,591,023 11 1.

On the 12th January, 1809, an advertisement being published in the Calcutta Gazette, inviting Sealed Proposals of contract to be made, for the remittance of the surplus revenue of Silhut in sicca rupees to the treasury of the Collector of Dacca from the 1st March, 1809, to the 29th February, 1812, without mentioning the amount of such revenue, I cannot state what was its amount; but at present, I am informed that the revenue of that district has not been paid in cowrees but in sicca rupees, being 3,04,000 rupees exclusive of Abkaree and Stamp duties.

As an idea seems to prevail that the Zumeendars in general, make enormous exactions from their ryots, I beg to observe that since British laws and regulations have been in operation in this country, all the people, subject to this mild and equitable Government, from the highest to the lowest, are deterred from committing any act of injury and oppression against any one; the Zumeendars therefore cannot make any unjust exactions upon their ryots, because a strict inquiry into such acts would immediately be made by the tribunals. It is also a fact that the respectable natives and descendants of noble families cherish their tenants as

The Abaca in the Philippines is a valuable article of commerce, as from it not only excellent cordage, and cloth equal to the coarse grass-cloth of China are made, but of late years considerable quantities have been exported, and I doubt not that from the great length, beauty and tenacity of the fibre it will become more and more appreciated as it is better known, particularly when *properly manufactured*; the great defect of Manilla made rope (its stiffness in rainy weather), arising from the coarseness of the yams; not more than three being used to a strand which should have nine or twelve. This I know from experience, having commanded a vessel in which both were used, and the latter (made by myself), was at all times as pliant as hemp.

It bears tarring well, and I have known it used even for lower rigging with success.

The bamboo scrape is held by the middle and the Abaca is introduced into the slit, which being dragged downwards, acts as a scraper on both sides at once.

Allow me also to forward you, by the same occasion, a few seeds for your establishment, and with my earnest wishes for the prosperity of your endeavours in the cause of science, request you to believe me

Yours, &c.

H. PIDDINGTON.

Amirpoor, near Sookhsagur, Dec. 1822.

XVI.—To Dr. N. Wallich, M. D. Secretary to the Horticultural and Agricultural Society.

SIR,

I request you will lay before the Society the accompanying letter from Mr. Piddington, one of the gentlemen who escaped from the Manilla massacre, giving an account of the mode of preparing Manilla Hemp; one of the machines with which it is prepared, and another also; the latter being either obviously incomplete or not intelligible to me.

I have another letter from the same gentleman, now I believe established near Sookhsagur, which would have given some further information, and also a specimen of Manila Hemp which he brought with him, but I have not been able to put my hand upon it.

In lieu therefore I submit specimens of Hemp prepared in my own garden from the following articles.

1st. Of *Musa sapientum*, or common plantains.

2nd. Of *Musa ornata*.

3rd. Of *Yucca superba*.

4th. Of *Musa textilis* formed from a coat stripped off about sunrise to-day which was manufactured as it is, I do not know the exact period ; but it was brought into the house at ten o'clock and has received no further bleaching from the sun or in any other way. I had some of this made into a neat cord, which was no way inferior to English whip-cord, and a part of which has gone to England. I regret that the present confusion of my house is such (being under repairs), that I am unable to exhibit the remainder. I will however, at our next meeting.

I bring this subject before the Society as intimately connected, I think, with several branches of agricultural and commercial interest.

I congratulate you too, gentlemen, that the hemp procurable from your overgrown common plantains will supersede the necessity of your monthly charges in twine, and enable you to turn the penny in a more profitable pursuit in the same line.

Yours, &c.

W. LEYCESTER.

March 12, 1823.

**KVII.—*A few brief notices on the state of the Population of Prince of Wales' Island, and of the price at which Opium is retailed in that Colony.***

BY THE SECRETARY.

[Read March 12, 1823.]

The following memorandums I take the liberty of submitting to the meeting in the hope that they may not prove altogether uninteresting. They were extracted from my journal, and as I have not had time to digest them, I flatter myself that the Society will pardon their shortness and superficial nature. On a future day I shall do myself the honour of presenting a more detailed paper on those matters, as also on such others, connected with the Islands of Singapore and Penang as may appear not foreign to the objects of our pursuits.

It is proper that I should observe here, that the principal source of my information has been a gentleman of the highest rank and abilities, a gentleman to whose enlightened views and great liberality I am indebted for whatever success may have attended my endeavours to investigate the Husbandry and Botany of Penang. I allude to W. E. Phillips, Esq. the worthy Governor of that Island. During my short stay there he had the goodness to furnish me with the substance of the following two sketches ; one of them exhibiting the state of the Population of the Island up to the 30th June last year, the other giving an estimate of the price at which Opium is retailed. From the former of these, compared to that of the preceding year (1821), which I shall not fail annexing to it, as soon as I can find it among my papers, it is most gratifying to observe, that the increase of the population has infinitely exceeded that of any former period. I venture to predict that under the wise and judicious proceedings of the Local Government, adverting especially to the active measures that are taking with the view to the population and cultivation of our part of the opposite or

Queda shore, of which I have had the pleasure of being an eye-witness, the political and commercial position of the island and its dependencies will soon and rapidly acquire an importance beyond that which it has ever before been able to maintain.

A census of the population of Prince of Wales' Island and its dependencies up to the 30th June, 1822, taken under orders of the Honorable the Governor in Council by Mr. R. Caunter, Superintendent of Police.

Malays and Buggese, .....	I.	19,767
Acheenese, .....	I.	454
Bataks, .....		867
Chinese, .....		8,856
Chulias, (coast people in general, such as Malabars, Teligus, &c.) .....		6,057
Bengalese, .....	I.	1,538
Burmas and Siamese, .....	I.	862
Arabs, .....	I.	150
Armenians, .....		19
Parsees, .....		13
Native Christians, .....	I.	1,026
Caffrees, .....		118
Itinerants supposed at this season about .....		2,000
Native Military, Followers, and Convicts, about .....		3,000
Europeans and their descendants, .....		410

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Total, 45,127

The population is distributed in the districts of the Presidency which are the following :

George Town,		} Prince of Wales' Island, 36,885
Jellutong,	I.	
Teluk Ayer Raja,	I.	
Glugar,	I.	
Sungei Kluang,	I.	
Western district.		

Kewalla Muda,	I.	} Point Wellesley, 7,954	
Teluk Ayer Tawar,	I.		
Prye,	I.		
Juru,	I.		
Pulo Jereja,	I.	} Islands, ..... 288	
Pulo Kra,	I.		
Pulo Remon,	I.		
Total, .....			<u>45,127</u>

Abstract Return of emigrants from the Queda country and Larkarvi to this Island and its dependencies up to 30th June, 1822.

Queda Malays, .....	4,118
Chinese, .....	62
Larkarvi Malays only, .....	1,944

Total, ..... 6,124

### REMARKS.

Our population has increased during the last six months between 2 and 3,000, and I think it likely to continue to do so from migration alone for some time. This increase has been entirely in Malays; other classes, viz. Chulias and Chinese, have diminished since December last. A fluctuation, however, always takes place in these classes in the course of the year, and the arrivals from the Coromandel Coast in September and October, and from China in December and January, will again considerably add to their number. The letter I, denotes the district and tribes increased since the last return.

R. CAUNTER,

*Sup. Police.*

I now proceed to the second subject of my inquiry, the consumption and retail of opium on the island, and shall confine myself to a few interesting facts only. Of all monopolies which the ingenuity of man ever devised, I think that

of the Honorable Company's opium trade not only the most judicious but the most desirable, affording as it does the only check that can possibly be opposed to the destructive extent to which the consumption of that drug would otherwise be carried. We are here, of course, confining ourselves to a consideration of it only as being an article of luxury, one of the most reprehensible and superfluous that ever existed ; we have nothing to do with it as a medicinal substance ; indeed its consumption as such is exceedingly small, compared with its other uses for eating and smoking. At Penang 28 chests are annually imported for the Malay and Chinese inhabitants ; the opium is submitted to a simple operation by which a first and second sort of extract, called Chandoo, is produced. I regret that I cannot state the exact proportion of these extracts, compared to the whole contents of the said 28 chests. It is sufficient, however, for my present purpose to mention, that the Company derives a revenue of from 3000 to 4000 Spanish dollars monthly, or from 36,000 to 48,000 dollars annually from the farmers who purchase the monopoly of retailing the drug. This abovementioned Chandoo or prepared opium for smoking is retailed by them at 5 pice per hoon, equal to 8000 Spanish dollars per chest, and on the opposite or Queda shore the hoon is sold at 6 pice or 9,600 dollars, nearly equal to 20,000 sicca rupees per chest of opium, or sicca rupees 560,000 for the 28 chests which, I said, were annually imported. If to this is added the amount of the farm, we shall have the sum of 656,000 rupees, produced by the opium over and above the price of each chest before it is sold on the Island, which of late has exceeded 2000 Spanish dollars or 4000 rupees. These multiplied by 28 give 112,000 rupees, which added to the above 656,000 furnish a total of no less than 768,000 rupees, or 384,000 dollars paid by so exceedingly small a proportion of the opium-eaters of this world, as the inhabitants of this little island and its dependencies constitute, solely for the enjoyment and luxury of becoming drunk and brutal.



Another most astonishing fact is the exorbitant disproportion which exists between the prime cost and the retail price. From my excellent friend Mr. Crawford's interesting history of the Indian Archipelago, vol. III. p. 518, it will appear, that the natural cost of opium, or the prime cost at which each chest of it stands the Honorable Company, is in Bengal about 112 sicca rupees. This if put in an arithmetical proportion with the retail price gives this result.  $112 \times 28 : 720,000 = 100 : 24,489\frac{1}{4}\frac{9}{9}$  in other words the consumer pays not less than 24,000 or 25,000 per cent. above the prime cost, and fortunate it is he has not to pay less !

In order to render the preceding statement more intelligible, I beg to subjoin a scale of Chinese weights.

10 Hoons weight is equal . . . . .	to one Chu,
10 Chus . . . . .	to one Teil,
16 Teils . . . . .	to one Cattce,

$7\frac{1}{2}$  Cattces average one cake of opium, and forty cakes make one chest.

*Botanic Garden, March 12, 1823.*

**XVIII.**—*On the application of Lime as a manure, together with observations on a new Species of Caulscent Cabbage, introduced by Professor De Condolle, of Geneva, into the Honorable Company's Botanic Garden at Calcutta. In a letter to the President of the Agricultural Society of Calcutta.*

BY THE SECRETARY.

[Read September 10th, 1823.]

MY DEAR SIR,

On the most extensive and ample field of research which presents itself to the Agriculturist and Horticulturist in this country, there can scarcely be imagined an object of greater interest than that connected with the improvement of land for cultivation. It is a branch of husbandry exceedingly little understood or pursued by the natives of this vast em-

pire, and one, which together with many, I had nearly said *most* others, are generally left to the spontaneous operations of bountiful nature, unaided by the interference of human skill or industry. It would be difficult, therefore, to devise a field for experimental research of more beneficial results and more likely to promote the objects of our Society, than that which embraces the amelioration of bad or indifferent soils. Under this view I venture to hope that the following short account of a successful trial lately made at the Company's Botanic Garden with unslaked Silhet dust chunam, as an ingredient of manure, may not prove altogether unacceptable to you or to our Society. My time has of late been too much occupied to allow my presenting any thing more than a mere rapid outline of the matter: I hope however on a future occasion to resume the subject and to bestow on it that detail, which it so amply deserves.

The second nursery in this garden had long stood in need of being extended by a suitable addition, and to this end I fixed on a spot of ground situated to the northward of the adjoining pond. In this selection I was guided more by the expedience of proximity than by any particular good quality of the soil, which however I have reason to think considerably better, and far less saline, than that of most other parts of the garden. Another object of importance was expedition, in order that the commencement of the present rainy season might be rendered available for immediate transplantation.

On an extent of one biga and twelve kottas which had been thoroughly dug and trenched two spits deep, was spread on the 1st of March last, 120 feras of vegetable matter consisting of leaves collected during last year in one of our pits; each fera or measure, of the size of that universally used by chunam venders; immediately upon that was spread a layer of 5 pukka maunds or 16 feras (the contents of each weighing about 1 maund 5 seers) of the best Silhet dust (stone), chunam. This process together with that of slightly turning the two layers with kodalees, took us two days, after which

the whole was repeatedly ploughed over to the bottom of the previous trenching, and the earth pulverised to such a degree as to favor a complete juxta-position of its particles with the mineral and vegetable manures. This business occupied a greater proportion of time than I had anticipated ; but the whole was finished before the 15th of March. The ground was then left alone after having been rolled and beaten firmly in order to prevent too great an influence of the atmospheric air, and the consequent rapid decomposition of the ingredients employed.

On the 1st of June we commenced laying out the ground thus prepared and planting it, and it is delightful to observe with what vigour and luxuriance the plants have since grown, exceeding by far any thing I have ever before witnessed ; as a proof of the correctness of this assertion, I beg leave to send you, for the purpose of its being laid before the Meeting to-morrow evening, a balsam plant which was raised from seeds in May and planted out in the new ground in the beginning of July. It measures three feet in height with a short stem of the following monstrous dimensions ; viz.  $12\frac{1}{2}$  inches in circumference at the base, and  $14\frac{1}{2}$  inches under the first branches. As an additional proof of the extreme richness of the soil on which this balsam has grown, I may adduce the unusually dense succulent root fibres, which shoot out from every point of the stem, incorporating themselves, as it were, with the surface of it. It is owing, probably to this exuberance of growth, that the flowers of the plant are single ; for many of the other plants of that description somewhat less herculean in size, than the present one, have very handsome double blossoms.

The preceding remarks may tend to establish the superiority of lime as a manure, in this part, at least, of India ; and as the expenses on that head were not very great (about 14 rupees for the 20 maunds reckoned at the enormously high charge of 70 rupees per 100 maund), I venture to conclude, that for small gardens, especially such as are intended for the cultivation of vegetables for the table, the mode of

manuring just described recommends itself as infinitely more enriching and productive than any other which could be adopted.

I propose carrying this inquiry to a considerable extent after the cessation of the present rains, in order to ascertain the effects of the application of Chunam, especially on brackish and sandy soils, in co-operation with vegetable as well as with animal matters.

Before concluding I beg to present you with some sprouts of a species of Cabbage perfectly new in this country, and which I take to be either the *thousand-headed Cabbage* described by Mr. Morgan, in an interesting paper on the subject of winter greens, in the 2nd vol. of the London Horticultural Society's Transaction, page 314, or a sort of *Chou de Milan*.

Be this as it may, the plant promises to be a most valuable acquisition, and deserves every encouragement of cultivation. The seeds were sent out to me by Professor De Condolle the illustrious Botanist at Geneva, in July last year, and immediately sown at the Botanic Garden, where the plant has this day attained upwards of  $5\frac{1}{2}$  feet in height, with a stem measuring 6 inches round.

It is easily multiplied by offsets, and I can vouch for the excellence of the tender shoots (which do not cabbage) for culinary purposes at a time of the year when vegetables are among our greatest desiderata.

I am, &c.

N. WALLICH,

Botanic Garden, Sept. 9, 1823.

Supt.

**XIX.—*Mr. Moorcroft on the Fruit Trees of Kashmeer and the neighbouring countries.***

[Read Oct. 13, 1823.]

TO N. WALLICH, Esq.

*Secretary to the Agricultural Society.*

SIR,

I have taken the liberty of forwarding to your address the seeds of Bread Corn and of other vegetables, the produce of the principality of Ladakh, for particulars respecting which I beg leave to refer to former communications to you as Superintendent of the Honorable Company's Botanic Garden.

Indigenous to a climate so much colder than the British Indian Provinces, perhaps but a slight chance exists for the whole of them retaining their original properties when raised in the latter, although many seem to possess strong powers of accommodating themselves to differences of locality, especially the yellow Lucerne, which appears to bear heat well if plentifully supplied with water.

The formation of the Society, it is hoped, may be hailed as an epoch of the very highest importance to British India by embracing the power of ameliorating the domestic condition of the natives, increasing the productiveness of the soil and through this of augmenting the territorial revenue.

And it is presumed that the Society will stand in the relation of an intelligent, practical and unexpensive agent between the Government and the subject, aiding the former with sagacious suggestions, and furnishing to the latter practical and beneficial results of well-conducted experiments without his incurring the risk of inadequate trial.

But as the Society seems to have a predilection for Horticulture I shall venture to submit a few hints on the procurement of fruit trees, the step necessary to their accumulation, and the means of raising them in vast numbers and at a slight expense, for subsequent diffusion.

Kashmeer is considered by me as under all circumstances, not only the most available source for the varieties of fruit

trees it possesses, but also for facilities of transporting them and of giving them the power of accommodating themselves to a high temperature.\*

In relation to the first object it becomes expedient to give a succinct detail of the fruits it now contains, which are as follows.

The fleshy and pulpy fruits of Kashmeer consist of Apples, Pears, Quinces, Peaches, Apricots, Plumbs, Cherries, and Mulberries.

The shell and stone fruits of Kashmeer, are Pomegranates, Walnuts and Almonds. Altogether the collection of fruits is highly respectable and announces an attention to Horticulture of no insignificant order, but through the influence of circumstances foreign to the object of this letter to relate, the best kinds *must speedily be lost* unless transplanted, or unless other changes occur, of which at present there seems little probability.

The apples may be divided into cultivated and uncultivated varieties; the former are named as under:

Kuddooseree, Sufur-kundee, Ambree, Kermanee, Khatoon, and Moe-ambree.

The wildings, or those not grafted, are, Suffed, or white Trela, Soorkh or red Trela, Jambazee.

Among the former, some have the acid, and others the sweet principle largely developed, whilst others again possess an agreeable union of both qualities; but in general flavor all the apples that have come under my notice are inferior to those of France or of England.

The former of this fruit varies considerably in character betwixt oblate-round and conical, and there is also a considerable variety in their coloring which is of green, yellow, and red, in distinct and different proportions of commixture. The size, form, and color of the Ambree entitle it to be held as one of the most beautiful of the apple family, and though thin-skinned and ripe in October I have seen it in high preservation in April.

The apples of Kashmeer are generally inferior to the most

avored kinds of apples in Europe for the dessert, yet for baking some seem almost equal to the codling; and many are of special promise for the press.

Were it necessary to indicate particular varieties, for the latter purpose it may be said that if the red Trela retain its qualities when acclimated in India its juice will yield a beverage perhaps rivalling that of the red streak, and that of the white Trela one emulating that of the Golden Pippin.

On the modes of extension it may be sufficient to observe that budding and engrafting are both practised, and that of the latter, the process called stock or crown grafting is simple and successful.

Pursuing a similar division of Pears, here called Putung, the cultivated varieties are the following, viz. Nakh, Gosh-buggee, Koturnul, Goolabee, Kaghzee, Nashpatee.

The wildings are, Seikatung, Tanjeh, Vetanjeh, Khurtanjeh.

I found only one variety ripe and which approximated in qualities to the white Beurree, though inferior in quality.

In Ladakh the Jargonelle and Cressanne were met with, and as the wild pear is not indigenous to this country, it is presumed that these varieties were introduced from Kashmeer.

The Quince or Boomzontoo is of three varieties, viz. Toorsh, Shereen, and Bedana.

The whole of the apple family of Kashmeer seem to be free bearers, and this remark applies especially to the Quince, of which the peculiar flavor is so much higher than any I have seen in Europe, that it is likely to afford a material under due management standing a fair chance of excelling the marmalade of Macon and is now converted into an excellent preserve.

Peaches, called Soppunoonoo, are of two varieties, distinguished more by one having a bitter and the other a sweet kernel than by the respective qualities of their pulp, and held therefore as indifferent.

Tser and Bhota Tser or Apricot of Tibet, neither particularly good.

The best of the family is the white Apricot of Baltee which is in perfection in the garden of the Kaloon or Prime Minister at Ayoo, but on account of the great distance is only procurable with much difficulty and expense.

A very large Apricot Kotach, is found, but it comes in season in the rains, and is generally spoiled owing to flies depositing their eggs in the pulp.

Plums are of few varieties, and as they are not yet fully ripe I can say little correctly respecting them, except that a green variety called subza borders on the green gage, but its sweetness is not sufficiently relieved by acid.

The best plum in India is a variety with small fruit in the garden of the Jooma Musjid in the Fort of Lahore. This has peculiar characters and seems to hold a rank between a loose-pulped cherry and a plum.

The cherries called here Gilas, are of three varieties; two approach to the character of the Bigarroux and May Duke, and the third is decidedly the Morel or late black bitter Cherry. The fruit is rather smaller than that of Europe, and of this, as well as of the Apricot, there are wild varieties.

Vines are of many varieties, both of exotic and indigenous origin; of the former are the Moskha, Sahibee, Hoosenee, and Kishmishee, which last was introduced by the Emperor Juhangeer Kabool. The latter, or those indigenous and cultivated, are, Pamuthil, Takree, Upamahee, Bura kawur, Nika kawur, Kacheeboor Kanahepee, Harduch, and Kathoo Hoosenee. The wild grapes are Deza, Kuwaduch and Umburbaree.

The four first are good, but it is said that those of similar name in Kabool are still better.

— The skirts of the southern face of the northern hills were formerly largely clothed with vines, and under Hindoo rule much wine was made.

The practice was continued to, or revived in, the reign of Juhangeer.



A little Brandy is occasionally distilled, even now, and under suitable management might vie with Cogniac.

The Mulberry has many varieties, with fruit large or small, sweet or sour, round, oblong and cylindrical, black or white, with and without seed.

The sweet are Boota, Seea, Suffed, and Bootanee.

The sour is the Shah Toot. No Mulberry of Europe or of Lower India is equal to the sweet varieties, of which the juice furnishes a material for wine and spirit. The fruit of the Shah Toot is much superior to the Europe Mulberry, being larger and more juicy, with a pure rich acid uncontaminated by any medicinal flavor.

This fruit would afford a great resource to the population of India as well when eaten ripe as for wine and vinegar.

The Pomegranate has the following varieties; viz. Duhan, Julalabadee, Kathidehun, Hudehun, and Jigree.

Several of these are particularly fine as to flavor, and the size is large.

The almonds are not especially good. The Walnuts are of four varieties; viz. Kanuk doonoo, which is wild and worthless; Wantoo, Doonoo, and Kaguzee. The three last are cultivated, and the Kaguzee is the best, but its thin shell exposes its kernel to the attack of the Boolbool.

In Kashmeer the Custom-house pass return of the produce of the fruit in oil and oil cake, amounts annually to 1,30,000 rupees, independently of the quantity of nuts consumed by man\*. The quality of the wood of the cultivated Walnut also, for gunstocks is little inferior to that of Britain.

Enough has perhaps been said to shew the resources of Kashmeer as to certain fruits; and imperfectly as they have been presented, even this exhibition may induce the Society to consider of the expediency of converting them to practical use, but it will doubtless occur to them as suggested above

\* Instead of Britain expending what almost may be considered the first mover of her industry to furnish inflammable gas, she has only to ask India to supply her with oil for the same purpose, and she will give an useful stimulus to agriculture in this country.

that a station intermediate between Kashmeer and British India is required as a nursery, and for enabling the trees to bear the greater degree of heat to which they will be exposed in the climate of the latter country.

And for the accomplishment of this there exists a site completely prepared and possessing every facility that can be desired.

This is the Shahlamer or Garden of Pingower, made by Fidaee khan, the son of Ulee-murdan khan, both formerly Governors of the Province of Kashmeer.

A well of well-constructed masonry in good repair completely includes an area of very considerable extent. This, adverting to my recollection, I should say contains about two hundred bigas, but a person more accustomed to estimate by native measures gives it double that extent.

Suffice it to say, that this area is very spacious, is divided into five terraces separated by breast-works of stone masonry, and descending to the south. Through the middle of this garden led by a canal lined with stone, descends a considerable stream of clear, well-tasted, and cold water, which by means of trenches at right angles with the main trunk, of simple structure and arrangement can be so diffused as speedily to flood the whole surface of the terraces.

This area at present contains only one large Lemon tree, some Lombardy Poplars, a few rose trees; five or six parterres of Poppies, and Larkspurs, and about half a dozen brood mares. It has upon it two small but neat houses with apartments for servants near the gate, and the whole is in good repair.

The garden with the adjoining country belongs to the Raja of Puteeala who however never visits it, and raises in it annually little more than a few seers of roses for the use of his physician.

It is respectfully submitted that the Raja of Puteeala would most readily cede this garden to the Government should they think proper to apply for it, as it is of no farther advantage to this chief than that already specified and would be

beneficially changed against a single tola of uttar from Gazee pore. But it is further submitted that it might be advisable to hire the neighbouring village at its accustomed rate of rent, as its inhabitants are addicted to gardening and would equally serve as laborers to work in this garden as to convey the fruit trees from the nursery to other places.

The stone canal is nearly choked with mud, but the stream still continues to force its way through the weeds, and a mere trifle would be sufficient to clear the channel and render the whole fit for an active system of operations through which many millions of trees might speedily be raised.

The establishment for the most perfect accomplishment of every object that might be wished need only consist of one invalid officer, two serjeants, a head Bengalee gardener, and a few occasional laborers. The procurement of the seeds, stones, cuttings, &c. from Kashmeer would not be accompanied with any very considerable expense.

Pingower is twenty-three days' journey from Kashmeer; three from Soobathoo to the south, and about nine from Delhi.

I have mentioned Kashmeer as the most available source for fruit trees that has yet fallen under my cognizance, and Pingower as the locality for a nursery. On the latter point there exists no ground for thinking there will be any change of opinion, but in the former there is a reservation in favor of Kabool, which may possess fruits of still superior quality. However in recording the value of the fruits of Kashmeer I have *pro tanto* discharged a portion of my duty towards the public, and if I should find the fruits of Kabool better than those of Kashmeer I shall endeavour to apprise the Society of this circumstance.

I shall now touch upon the surface of water as connected with gardening. This has hitherto, in British India at least, not been pressed into the service of man for raising food, although available in no slight degree for that purpose in Kashmeer, and in proof of this assertion I shall beg leave

to trouble you with a brief abstract of the substance of a note addressed by me to the British Board of Agriculture.

The edges of the lakes of Kashmeer are fringed with verdure proceeding from several varieties of sedge reed and other aquatic plants which extend considerably into the water, and these also spring from shallows and banks in various parts of the large expanse. The disposition of the *Gladiolus* to detach its roots horizontally so as to produce a matted and tangled net-like texture is well known, and the Kashmeeree gardeners have applied the result of this propensity to an useful end.

When the frost has broken up and the waters are yet low as in the beginning and middle of March, the gardener by means of sickles and spades cuts off the roots of sedge banks horizontally about two feet below the level of the water, and when a considerable extent has been completely detached from the bottom he divides it perpendicularly by two straight parallel lines, so as to form a slip of great length. This is intended to be a floating, flexible bed, adhering and matted together about two feet in depth, six feet in breadth, and say an hundred feet in length. Its general texture is at first loose, open and readily separable, so that it would drive before the influence of the wind or along the current if not prevented. To give the float a consistence suited to his purpose the gardener presses its sides towards each other with his spade, and when he has reduced the breadth to about two yards he shaves from the surface whatever grass may have grown upon it, strews this horizontally, adding other sedges and reeds which several men compress by kneeling upon them. When the platform has become a little compacted, mud drawn from the bottom of the lake is laid as a coating upon it, and if the float be distant from the habitation of the gardener, which is ordinarily on the edge of the lake, he ties his new acquisition to his boat and tows it to the neighbourhood of his residence, when by pushing through its extremities two strong stakes into the bottom of the lake he moors it to his convenience.

The next operation consists in the gardener extricating from the bottom of the lake the conferva and other plants which there abound, and this he effects by thrusting amongst them from the side of his boat a long crooked pole which by being twisted round, several times in one direction and then pulled up reaches his hand fully clothed with weeds. When his boat is loaded he disposes of its cargo by twisting the weeds into a kind of turban about two feet broad, at its basis of the same height, but narrowing to half the diameter at its top. This turban or cone has its sides about ten inches thick below and eight at the top, with a cavity of about four inches in depth and eight in breadth, which is filled with mud from the bottom of the lake, but by the projection of the capped edges remains in form.

These floats and cones are intended for the production of Cucumbers, Melons, and Water-melons, of which the plants are raised under mats as soon as the frost has left the ground, and are set out when each has got two rough leaves in the number of three plants in each cap or cone. The cones are placed in three lines along the platform, viz. one of Cucumbers on each side, and one of Melons in the middle, and each cone with its vines is calculated to occupy two square yards of which the cone forms the centre.

In the beginning of June, the fruits of the Cucumber, though somewhat small, are fit for cropping, and are sold at the rate of three for a pice, but as the weather increases in heat, and the crop is more plentiful, they become gradually cheaper, till at length they reach from ten, and in some seasons, even to twenty for a pice.

The Cucumbers are from five to seven inches in length, and from one and a half to two inches in diameter. The variety cultivated is smooth, with scarcely any tubercle or prickle in the skin, and rather glossy and shining than covered with that opaque bloom which is a recommendation in Europe.

It is said that the averaged produce of each plant is about thirty, or from ninety to a hundred of full-sized fruit in every

cone, weighing each from a quarter of a pound to a pound and a half.

The season lasts from three months to three months and a half. Between the time of each fruit setting to the period at which it is fit to be pulled, generally seven or eight days elapse. The fruits first set on the crown shoots, and for above a month the crop is confined to the cup of the cone, after which the vines begin to contribute to the supply; about three weeks after the commencement of the fruiting season, it is customary to earth up the crown shoots with about two handfuls of fresh mud and no other care is required.

The Cucumbers thus raised are thin-skinned, thick in flesh with rather a small seed tribe. On the whole those grown on floats are somewhat less bitter as to their skin than those of the same variety raised in the common way, the flesh seems more easy of digestion, and notwithstanding it is eaten most largely during the summer months, seems to agree well with the stomach.

In the second month the cones of the Melons are increased in bulk, through being girt round with an additional rope of weed to the size of a low and somewhat broad haycock. Melons are sold from one pice to four pice each, and in the value of their produce equal that of the Cucumber plant, although much inferior in number. The seed of the common Melon is imported annually from Baltisthan or Little Tibet, a precaution necessary to prevent degeneracy of produce; the fruit of the first year range from five to eight pounds, but the fruit given from Melons thus raised in the second year does not attain to half that weight. It is reported that the quality of the Melons thus raised is good, that unless eaten to great excess they seldom disagree with the stomach, and that persons who almost live upon them during the season are healthy and disposed to get fat.

In regard to Cucumbers it is asserted that every cone yields about the value of a rupee in a season; subtracting from this produce the value of labor in preparing the float, in

watching the crop and in carrying the fruit to market, it is presumed that somewhat above a third, and perhaps, one-half of this sum may be assumed as to the clear profit.

It follows then, that in English money ten pence or a shilling is obtained, and eighty pounds of food procured for human beings, from two or three yards of water surface.

This view is presumed to be sufficiently encouraging to induce an adoption of this mode of culture on waters which, from their nature and vicinity to large towns, are suited to this object.

It will readily occur that if aquatic plants are not furnished by the lakes on which it is advisable to make the experiment, that a ready substitute is to be had in a wattled texture of twigs in the form of troys or cradles loaded with faggots of brushwood and grass, and coated with coarse mats and earth.

However far removed in the prima facie appearance this method of cultivation may seem from that which is practised on the dry loose sands of the beds of rivers, and of plains for vegetables of this description, it will be found to rest upon the same principle of moisture raised by capillary attraction and by the heat of the sun to within the reach of the absorbing powers of the plant.

This practice seems susceptible of very extensive application and of bringing a surface hitherto of little value into useful employment through raising food for man, plants for medicinal purposes, for the arts, and even as food for cattle.

I witnessed so striking a difference between the condition of the yellow Lucerne\* near the summits of the dry mountains of Lama Yooroo, and of the same plants when skirting the water-courses of Dras as might almost have countenanc-

\* Lucerne in its natural state bears a yellow flower of a rich scent and is of great longevity, under the influence of cultivation, it runs through a diminished sulphur tint into whiteness, becomes green with a stain of red, and settles permanently in pink and purple; it also loses its fragrance and becomes short-lived.

ed a suspicion that there was a greater difference than what arose from locality alone.

At Poosa, I occasioned the Government to expend considerable sums in wells, and other arrangements for the purpose of watering Lucerne grounds, of which the supply was scarcely ever fully adequate in the dry season, and the plants of which died when their crowns were long submerged in the rains.

The facts I have now seen in regard to the almost aquatic nature of this plant, lead to a suspicion that if a modification of float system had been adopted on the edges of a river with a very slow current during the largest portion of the year, and which embraced a great extent of the grounds in a crescent, that an immense quantity of excellent forage might have been raised, and the expense of wells, the labor of cattle and of gardeners might have been saved.

In concluding this address I ought not to forget to observe that the floating gardens of Kashmeer are frequently surrounded by a floating fence formed by a belt of reeds, sedge, fern and other aquatics and of which the boat ways, open only at particular times, are shut by bands or ropes of twisted twigs with an accuracy that may puzzle a stranger to discover them unless he remark their features with great acuteness.

Floating gardens of great extent are sometimes stolen during the night and towed a considerable distance, and when mixed with others of a similar character it is difficult to recognize the stolen property.

To prevent this occurrence and mischiefs occasioned by nocturnal thieves and other depredators and trespassers, one or two persons generally pass the night in a boat under the cover of a few reeds in their neighbourhood.

I am, &c.

W. MOORCROFT,

*Supt. Hon. Com. Stud on Dep. to Central Asia.*  
*Kashmeer, July 8, 1823.*



XX.—*Mr. Moorcroft's account of Prangos, a plant used in Droz for making hay; communicated to the Society by the sanction of Government.*

[Read Nov. 19th, 1823.]

DEAR SIR,

Under the sanction of the Supreme Government, I do myself the honor to transmit to you, for the purpose of being presented to the Agricultural Society, at the meeting of this evening, copies of a letter, which I addressed to Mr. Secretary Lushington on the 27th September last, and of a highly interesting document from Mr. Moorcroft therein referred to.

I have the pleasure to remain, with great regard,

Dear Sir,

Your very faithful servant,

N. WALLICH.

*Botanic Garden, Nov. 19, 1823.*

To C. LUSHINGTON, Esq.

*Secretary to Government, General Department.*

SIR,

I have the honor to acknowledge the receipt of your letter of the 25th instant, giving cover to a letter to the Chief Secretary to Government from the Superintendent of the Honorable Company's Stud, dated the 15th of August 1822, and a private communication from Mr. Ludlow to the last mentioned officer, dated the 2nd of July last, together with two boxes accompanying the despatch.

2. Conformably to the orders of Government, I immediately proceeded to examine the two boxes, the contents of which I found to be as follows :

1. In the larger boxes a large bag of the seeds of the plant producing the Prangos hay.

2. In the small ditto, three parcels each containing an entire Prangos herb, one of them cut a month before the usual time of gathering.

3. Ditto, a cross section of the top of an old Prangos root.

4. Ditto, three specimens of young roots with the bottom of the plant attached, also a separate fourth section.

5. Ditto, a small parcel of unripe Prangos seeds.

3. With the exception of the bag itself containing the seeds, and a few of the outermost of these latter, which were much damaged by mouldiness, I had the satisfaction of finding all the rest of the seeds and the other articles in an excellent condition : a very fortunate circumstance considering the vicissitudes they must have undergone during the thirteen months of their passage down to the Presidency.

4. I have taken every possible precaution with the view to the preservation of this despatch, but I greatly apprehend that the age of the seeds superadded to the extremely detrimental influence of this climate on their vegetative power will form a formidable barrier to the expectations of rearing the plant from the present supply.

5. As far as I can judge from detached seeds and the dried leaves only, of a plant belonging to one of the most difficult tribes (the umbelliferous) the Prangos constitutes a gigantic species of *Laserpitium* which the valuable detail contained in Mr. Moorcroft's letter establishes beyond a doubt as a most important and interesting object of rural economy.

6. In order to give every chance of success to the laudable and meritorious exertions of that scientific gentleman, to whom this great discovery is due, I beg leave to suggest the following mode of distribution which I feel assured would be approved of by him if he were on the spot.

7. As soon as the weather becomes a little dry (the present damp state of the atmosphere being extremely unfavorable to such an undertaking) I propose packing up two boxes to the address of the Honorable Court of Directors, each containing a large quantity of Prangos seeds with the specimens of Hay, &c. divided among them ; and shall without loss of

time transmit to you a memorandum of their contents, in order that they may with the least possible loss of time be forwarded to England by the first two ships that may sail. I shall likewise, conformably to the instructions contained in your letter, make ready a box for the Government of the Cape of Good Hope.

8. The quantity of seeds in the present collection being so very ample, I submit the expediency of distributing small parcels, containing about an ounce each, to Nipal, Saharunpore, Kumaon, to the Eastern Islands and the Mauritius, thus affording this remarkable plant every encouragement of growth from variety of soil and climate. This mode would afford an additional chance under a supposition, that the seeds, though still alive, may possibly lose their last spark of vegetating power during the four or five additional months of danger, which a passage to England necessarily implies. Most happy shall I be if the seeds, which were sown in the garden the very day after the receipt of the boxes, may enable me to report favorably of their germination.

9. The document of Mr. Moorcroft is so highly deserving of promulgation, that I solicit the sanction of His Lordship in Council for my submitting it to the Agricultural Society of Calcutta; and finally I request the favor of being indulged with a copy of the communication to the Board of Agriculture of Great Britain alluded to in it.

I have, &c.

N. WALLICH,

*Supt.*

*Botanic Garden, Sept. 27, 1823.*

To W. B. BAYLEY, Esq.

*Secretary to the Government.*

SIR,

Wishing to employ as usefully as possible the time I am compelled to wait for the final answer of the Chinese Authorities of Eela, to my representation, I lately undertook a journey to Imbal or Droz, for the purpose of examining into

the reported qualities of a plant produced in that neighbourhood, and of which the accounts I had received seemed to border on exaggeration.

2. This plant called Prangos, is employed in the form of hay as a winter fodder for sheep and goats and frequently for neat cattle, but its seed when eaten by horses is said to produce inflammation of the eyes and temporary blindness.

3. During a stay at Imbal of nearly a month, in which I was occupied principally in acquiring an acquaintance with various details respecting the plant, I drew up a letter on this subject to the Secretary of the Board of Agriculture of Britain which I purpose to request the favor of having forwarded under cover to the Chairman of the Honorable the Court of Directors.

4. And the whole will be transmitted to your address with the envelopes unsealed should you think proper to examine their contents.

5. The properties of Prangos as a food appear to be heating, producing fatness in a space of time singularly short, and also destructive to the *Fasciola hepatica* or Liver Fluke, which in Britain after a wet autumn destroys some thousands of sheep by the Rot, a disease that to the best of my knowledge has in its advanced stages hitherto proved incurable.

6. The last mentioned property of itself if it be retained by the plant in Britain, and—there appears no reason for suspecting that it will be lost—would render it especially valuable to our country.

7. But this taken along with its highly nutritious qualities, its vast yield, its easy culture, its great duration, its capability of flourishing on lands of the most inferior quality and wholly unadapted to tillage, impart to it a general character of probable utility unrivalled in the history of agricultural productions.

8. When once in possession of the ground, for which the preparation is easy, it requires no subsequent ploughing, weeding, manuring, nor other operation, save that of cutting and of converting the foliage into hay.

9. Of its duration I have two facts, viz. one of its seeds having been carried westward along with those of yellow Lucerne above forty years ago, sown on the Eastern frontier of Kashmeer, where they vegetated and of which the plants of the first growth still remain in a flourishing condition. In the second instance the seeds were transported Eastward and sown upon rocks near Molbee, where their plants flourished for about forty years, but in consequence of a long period of drought, during which there fell scarcely either rain or snow, the Prangos perished along with the crops of that district in general.

10. From various facts it is conceived not unreasonable to presume that by the cultivation of this plant moors and wastes hitherto uncultivated, and a cause of disgrace to British Agriculture, may be made to produce large quantities of winter fodder, and that the yield of Highlands and of Downs enjoying a considerable depth of soil may be trebled.

11. I have made every precautionary arrangement in my power by presents, &c. for gathering, drying, packing and transporting a large quantity of the seed, and have left Mr. Guthrie, the Apothecary, to superintend their operations; one cask will be transmitted through Kashmeer, and two others through Bushehar to your address.

12. And I take the liberty of submitting to the most noble the Governor General in Council the probability of this plant being of use to the new settlers, our countrymen, at the Cape of Good Hope and to the Colonists in general.

13. As the Prangos has hitherto been of spontaneous growth alone, practices better adapted to the nature of the plant or of the country may be adopted at a future time, but from a view of its habitudes in its wild state I venture to suggest that the seeds be dibbled singly into holes an inch deep and a foot apart, a short time before the rainy season.

14. During three years the plants will be little productive, but in that interim they will not be in the way of any other surface crop, should the proposition, I shall further submit in conjunction with this culture, be not approved.

15. I have purchased and made arrangements for the keep of upwards of a hundred head of a race of sheep, the smallest perhaps known, but which in fineness of fleece may vie with the Merino under the advantages of a much hardier constitution and of a better carcass.

16. By the time the Prangos will be fit to cut, this flock will probably admit of supplying drafts for transmission to the Cape; and for the convenience of the wool staple and of the woollen manufacture, I have divided the stock into blacks and into whites, to be kept apart; but the bodies alone of the latter are of this color, the heads and frequently the legs being orange dun or black.

17. Should the present arrangement fail, measures are taken for procuring future flocks, and the details will be found amongst my papers, should I fall and they pass into British hands.

18. In connection with the preceding speculation it is respectfully submitted that eight or ten pounds of the Prangos seed be transmitted, under the precautions which may be suggested for the preservation of their vegetative power by the Superintendent of the Botanic Garden to the Governor of the Cape of Good Hope.

19. Should they vegetate, it will be perfectly easy to procure a large supply of Prangos seed by the agreement I have made with Ribjhias the Keuplun, and with Mahomed Khan the Chummul of Droz, and of which the details will be seen in the note on Prangos seed attached to my letter to the Secretary of the Board of Agriculture.

20. Yellow Lucerne; this plant which is also a spontaneous production of this country is of a constitution more hardy than that of Europe, requires no other culture than that necessary for sowing it, and lasts in vigor for a long series of years.

21. It is submitted that as it naturally grows along with Prangos it would be well to imitate this habitude; the joint yield is vastly greater than that of the richest meadow-land, and is produced in this country on a surface of a most sterile

nature in regard to other herbage, hence is respectfully suggested the propriety of furnishing a few pounds of this seed to the Cape of Good Hope to be sown along with the Prangos.

22. I have furnished money to the Hakeem of Pushkoom for two sacks of Lucerne seed, but am not so sanguine as to this being pulled when in as perfect a state of ripeness as that of the Prangos; arrangements have been also made with the above mentioned person to furnish more if called upon so to do.

23. That Barley of this country which when ripe, slips from the attachment with its husk, is known by the generic term of Sheroka or Nus, and there are seven varieties as follows, viz.

Tibet Names.	Translate.	Period from sowing to reaping.	
		Months.	Days.
1. Nus Toogzur,	Six-seeded Barley, .....	4	15
2. Nuk Nus Toogzur,	Black six-seeded, .....	4	0
3. Mendokh Nus,	Beardless Barley, .....	4	0
4. Nak Nus,	Black Barley, .....	4	15
5. Nus Chema,	Late Barley, .....	5	0
6. Nus you Kaimo,	Easily or quickly digested, .....	4	0
7. Jiok Nus,	Early Barley, .....	3	10

24. The nusswa or common barley has no other merit than that of being hardy, and these above mentioned also are of a hardy constitution, bear well sudden changes from cold to heat or contrariwise, and apparently agree with a continued temperature whether high or low, but under the influence of the former undergo a change.

25. The yield of this barley in Tibul is greatly superior to that of common barley in Europe, and it is presumed capable of being more advantageous both for meal and malt. It is therefore respectfully submitted to the Most Noble the Governor General in Council that a few ounces of each variety be transmitted to the Cape.

26. This experiment is recommended on a small scale the first year, as it will be easy to obtain any quantity of the varieties which may from that, seem most likely to answer

there, by addressing a letter to Razee Khan at Delhi or at Wakka near Molbee, and by whom a promise was made yesterday to furnish whatever kinds may be required for Britain.

27. But according to the custom of this country it will be well to send with the letter a small present as a gun, single-barrelled, or a pair of pistols and appendages, which compliment will serve to ensure his attentions to this object for the future, and I am not aware of any other individual equally capable and willing to execute this commission.

28. Hussora wheat. According to the conclusions I am able to draw from the crops now on the ground, from the reports of individuals, and from the limited specimens of this grain which have yet come to my hands, I am disposed to think this grain may be cultivated both in Britain and at the Cape to advantage, but especially in the former country, until such time as the latter be capable of raising manure, this wheat requiring ground either originally rich or brought into good heart by ameliorating means of which the best kind is sheep's dung.

28. Measures are taken to obtain this wheat as well from Hussora itself as from those districts of Ladakh into which it has been introduced, and it is submitted with deference, that a small quantity of this seed also be transmitted to the Cape of Good Hope.

29. And from a general view of the value of the articles just mentioned as well as from reference to some analogy between the climates of Tibet and of Canada it is deferred whether it might not be worth while to transmit small parcels of each article to the latter country also for trial.

30. Rhubarb; I directed Mr. Guthrie to prepare a certain quantity of the root of the variety most common in this country, (*Rheum Rhubarbicum foliis integris*), in different ways.

31. Having subjected this to trial, I find its purgative quality to the full as great as of that procured from China.



32. A fortnight ago I had nearly a sack full of the Ladakh Rhubarb intended for transmission to Calcutta, but on crossing the high pass of Subbarsha the sack slipped from off a horse in the descent, and in its fall so slid and bounded as to force open the neck, by which the Rhubarb and stock of Tea were dispersed over a long tract of declivity to a bed of snow forming a bridge across the Tudjee river.

33. I have however desired Mr. Guthrie to prepare more in the simplest manner possible, that is by merely slitting the root lengthways cutting it across into lengths, taking off the cuticle and exposing the pieces to the sun, as Rhubarb thus prepared has been found fit for medical use, and also for being *packed within* a few days after being taken up.

34. It is by no means clear that the extracting the gum is beneficial either to the medical properties of the drug or to its keeping.

35. According to what I have seen, the Honorable Company may speedily have it in their power to furnish Britain, if not the markets of Europe, with this valuable drug from their own territory at a rate much below that at which it is now imported from any other country, provided the variety of Rhubarb I have tried retain its qualities on being transported, and that its merits be estimated, not by the size of its pieces, but by the actual operation of the medicine.

36. If however the pieces be required to be as large as those from China, it is conceived that this object may be attained also by a little common management in the Honorable Company's mountain dominions within a very few years, through the plan alluded to in a note on this drug attached to the letter so frequently alluded to in this communication.

I am, &c.

W. MOORECROFT,

Supt. Hon. Comp. Stud, on Dep.

to Upper Asia:

Wakka, left bank of the Molbee Ches,

Aug. 15, 1822.

XXI.—*Statement of the Weather for 22 years, 1800 to 1822 inclusive, made at Krishnagunj near Rungpoor. By Mr. McDOWALL.*

[Read January 14, 1824.]

MY DEAR SIR,

I have the pleasure to forward to the Agricultural Society a statement of the Weather for the last twenty-two years, kept by Mr. McDowall, at Krishnagunj near Rungpoor. The observations in question are not so minute or exact as could have been desired, but I have nevertheless thought them of sufficient value to be submitted to the Society with reference to the long period of time which they include.

Yours sincerely,

D. SCOTT.

*Rungamuttee, 22nd Dec. 1823.*

*State of the weather from 1800 to the year 1822 inclusive, 22 years.*

<i>Years</i>	<i>January</i>	<i>February</i>
1800	A slight fall of rain on the 1st. Mornings and evenings cold. Westerly winds.	One shower of rain this month. Westerly winds towards the end, weather warmer.
1801	Cloudy Strong westerly winds Weather very cold throughout.	Temperature increasing, cloudy generally in the 1st part, latter clear
1803	A slight shower on the 23rd, cool throughout.	Weather becoming warm Cloudy weather throughout.
1804		On the 12th, heavy rain, middle and latter parts cool and cloudy weather
1805	Northerly winds prevail, cool and clear throughout	Foggy mornings, clear, middle and latter parts, temperature increasing.
1807	First part clear and cool, rain on the 20th, wind easterly, hills visible.	Mornings foggy, cool throughout, wind variable, latter part cloudy
1808	A slight shower, cool and mild throughout, 30th, a slight north-wester.	Foggy, mornings and evenings cool, northerly breezes
1809		A slight fall of rain on the 28th, westerly winds prevail *
1810	Excessively cold this month, northerly breezes.	After the first week temperature increased, westerly winds prevail.
1811	First rain on the 20th, cool throughout.	8th Change of weather, a little rain on the 14th, cloudy to the end
1812	Cold northerly winds prevail, occasionally foggy Weather changing towards the end	Mornings and evenings cool. Temperature increasing.

<i>Years.</i>	<i>March.</i>	<i>April.</i>
1800	No rain this month; wind variable. Temperature increasing.	North-westers this month and several showers of rain. Wind westerly.
1801	A slight N. wester on the 1st. Westerly winds, and cloudy to the end.	Hot winds prevail in the early part; a north-wester and little rain on the 20th and 21st; sultry and showery to the end.
1803	Fair and mild weather; westerly winds prevail; on the 30th, a north-wester.	Early part, cold weather; one N. wester and heavy rain. Variable winds.
1804	No rain; sultry throughout.	First and middle parts very sultry; on the 27th, a N. wester; cloudy and cool to the end.
1805	Hot westerly winds prevail. Mornings and evenings cool.	3rd. First rain and N. wester; 10th. Hot winds again to the end of the month.
1807	Early part a little rain; towards the end, hot winds commenced.	Hot winds prevail. On the 24th, N. wester and heavy rain; cloudy and cool to the end.
1808	Three N. westers this month and some showers; cloudy to the end.	Great proportion of rain this year, generally cloudy and sultry.
1809	Foggy and cool 1st part; cloudy and a little rain towards the latter.	Cloudy and very stormy three mornings, and heavy rain on the 20th.
1810	Three severe N. westers, accompanied with hail. Wind variable.	Much rain this month; N. westers, occasional fogs; an earthquake on the 1st and 7th.
1811	No rain this month; westerly winds prevail; sultry to the end.	Three N. westers; occasional hot westerly winds and showers.
1812	First rain on the 2nd; westerly winds prevail; a slight shower on the 26th.	2nd. First N. wester on the 30th N. wester and heavy rain. Hot winds on the 8th.

# No. 6 STATE OF THE WEATHER FOR 22 YEARS.

<i>Years.</i>	<i>May.</i>	<i>June.</i>
1800	Hot westerly winds prevail in the first part; cloudy and some rain towards the latter.	Rains set in 7th; several days of rain. Rivers rising about the 20th; latter part cloudy and showery.
1803	Fresh easterly winds, N. W; on the 6th heavy rain, clear to the 20th, showery to the end.	Rains set in 1st; rivers rising on the 4th; cloudy and fair weather; sultry and cloudy to the end; rivers falling.
1804	First part much rain; four N. westers this month; cloudy generally. Rains set in 28th; rivers rising on the 30th.	Flying showers, heavy at times; from the 26th excessive rain, and rivers increasing hourly.
1805	Two north-westers this month; not much rain; cloudy and sultry generally.	The latter part very stormy. Rivers and nullahs over their banks; rains set in on the 20th.
1806		Rains set in 4th excessively this month; early part country inundated. Rain the greatest part of the month.
1807	Much rain, and several N. westers. Cloudy, with occasional sunshine latter part.	Weather very mild; occasional showers throughout. Rains set in 30th.
1808	A rather dry month towards the end; one N. wester; occasional hot winds.	11th. Rains set in very mild; showery throughout. Two shocks of an earthquake.
1809	Rains set in 29th; a great proportion of rain this month; cloudy and sultry.	Rain excessive from the 1st; rivers very high. One severe N. wester.
1810	First part very sultry, middle showery and a N. wester; latter part sultry.	Rains set in 2nd; very severe storms and heavy rains this month; country inundated.
1811	Frequent showers this month; three N. westers; cloudy and sultry.	2nd. Rains set in very mildly. Rivers little affected; two N. westers. Sultry to the end.
1812	Very sultry this month; two N. westers and frequent showers. Rivers beginning to rise on the 20th.	Rains set in 7th very mild; rivers low. 19th, heavy rain; rivers rising rapidly; 30th, much fallen.

Years.

July.

August.

- |      |                                                                                                            |                                                                                                      |
|------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| 1800 | Early part much rain ; rivers very high on the 12th ; towards the end of the month falling ; weather mild. | First part fair and very sultry. Cloudy and showery from the 20th to the 31st.                       |
| 1803 | This month showery throughout. Rivers rather low for this season of the year.                              | Excessively sultry early part : slight showers ; again sultry with rain ; rivers rising on the 25th. |
| 1804 | To the 16th rain excessive, country under water ; cloudy with occasional showers to the end.               | Early part much rain ; middle sultry and cloudy. Rivers falling ; showery and sultry.                |
| 1805 | Stormy to the 5th ; cloudy to the 20th ; showery with occasional showers of heavy rain to the end.         | Showery early part ; middle and latter parts cloudy and sultry.                                      |
| 1806 | Showery early part ; middle cloudy and sultry ; heavy rain towards the end.                                | Heavy rain and showers early part. Cloudy ; latterly much rain. An earthquake.                       |
| 1807 | Early part some heavy rain. River beginning to rise. Season a dry one ; very sultry.                       | Excessively sultry. Cloudy ; variable breezes. Rivers within their banks.                            |
| 1808 | First and middle parts showery and some heavy rain. Weather very cloudy and sultry.                        | Great proportion of fair weather ; sultry ; some slight showers towards the end.                     |
| 1809 | Country deluged ; middle part sultry ; showery to the end of the month.                                    | Early part sultry ; some showers ; country rather dry.                                               |
| 1810 | Showery all the month ; some heavy falls ; sultry in general.                                              | Early part much rain ; latter cloudy and sultry.                                                     |
| 1811 | Much rain early part ; rivers increasing ; middle sultry, towards the end more rain.                       | Heavy rain and showers first and latter part ; middle sultry and cloudy.                             |
| 1812 | An exceedingly dry month ; occasional showers and sultry.                                                  | Occasional heavy showers, rivers remarkably low, fair and sultry.                                    |

<i>Years.</i>	<i>September.</i>	<i>October.</i>
1800	First part exceedingly warm. Showers from the 10th. Heavy rain on the 16th; showery and sultry to the end.	A good deal of rain early part. Rivers falling on the 25th; sultry to the end.
1803	Sultry with occasional heavy rain. Close and clear to the end.	
1804	Very sultry first part; occasional showers; weather sultry to the 20th; heavy rain towards the end. Rivers filling again.	Slight showers first part; cloudy and cool to the end. Bhootan hills visible on the 28th.
1805	Much rain this month and rivers very high throughout.	Early part showery; middle and latter parts fair and sultry.
1806	Oppressively hot the first part. Showery, fresh easterly breezes. Sultry to the end.	Extremely sultry and foggy. Cloudy and cool latter part.
1807	Early stormy with heavy rain. Cloudy; latter part sultry.	Occasional showers early part; latter part cloudy and mild.
1808	Early part excessive rain, middle sultry and cloudy, latter showery.	Showery; weather mild; cloudy and clear alternately.
1809	Some rain, but in general cloudy: sultry to the end.	Foggy and sultry; one heavy fall of rain; cold to the end.
1810	Early part very sultry and cloudy; severe storm from the 26th to the 28th; country again inundated.	First and latter parts cloudy and sultry, middle showery.
1811	Early part heavy showers; excessively sultry and cloudy latter part.	Cloudy and sultry throughout; a few showers; clear weather.
1812	Early part fair; middle very stormy with heavy falls of rain; country flooded towards the end.	Cloudy and sultry; northerly winds setting in; one heavy shower during the month.

<i>Years.</i>	<i>November.</i>	<i>December.</i>
1800	Early part cool and cloudy, occasional showers, and hazy weather; on the 6th an earthquake.	Cold weather set in; foggy mornings and northerly breezes.
1803		Cold weather and gloomy; hazy and a slight shower towards the middle.
1805	Cold weather set in early; northerly breezes; latter part P. M. sultry.	Weather not so cold as last year; cloudy with some fog.
1806	Mornings and evenings cool; middle of the day sultry; weather mostly cloudy; cold weather set in towards the end.	Foggy mornings; variable breezes and fair throughout.
1807	Cold weather setting in; northerly breezes; hills visible; mornings foggy.	Some rain this month; mild and fair weather; an earthquake.
1808	Northerly breezes; cold weather setting in; middle of the day hot; latterly very foggy.	Weather very cold; wind changeable.
1809	Mornings and evenings mild; cloudy and clear alternately; cold weather about the middle of the month; an earthquake.	Mild throughout and clear.
1810	Foggy mornings; cold weather set in early, wind changeable.	Early part extremely foggy. Cool easterly winds; latter part clear and cool.
1811	Foggy mornings; cold weather set in early; northerly breezes.	Rather foggy weather; cold weather commencing.
1812	A very cold month; clear throughout; cold weather set in early.	First and middle parts clear and cool; latter cloudy and foggy.



<i>Years.</i>	<i>January.</i>	<i>February.</i>
1813	Early part clear and mild; variable winds and foggy.	Change of weather on the 6th; warmer, clear and cloudy; towards the end as cold as in January.
1814	A slight fall of rain this month; weather changeable and cold.	Temperature increasing; on the 6th, 17th and 18th some rain; cloudy.
1815	Cool throughout; a shower or two at the latter part.	Rain on the 4th, 7th and 8th; weather mild, cloudy throughout.
1816	First rain on the 11th; early part cool towards the end westerly winds.	North wester on the 29th. Westerly winds prevail.
1817	Slight shower on the 18th; foggy, cloudy, and cool.	Much rain this month, cloudy and cool.
1818	Early part foggy. On the 17th, 30th and 31st rain; latter part very cold.	Rain 25th, 26th and 27th. Temperature increasing on the 20th.
1819	Exceedingly cold this month. On the 20th Thermometer 45° in the morning.	10th. Temperature increasing, Clear throughout.
1820	1st part clear and mild; latter foggy and cloudy. Thermometer 54° to 66°.	Mild throughout; first rain on the 15th; cloudy to the end. Thermometer 60° to 78°.
1821	Fresh northerly breezes. Hazy weather; a little rain on the 9th. Thermometer 54° to 70°.	Early part foggy and cool, latter gloomy. Thermometer 59° to 72°.
1822	On the 1st and 22nd, slight rain; early part clear, latter cloudy. Thermometer 58° to 68°.	Occasional showers; cloudy and foggy. Thermometer 61° to 73°.

# STATE OF THE WEATHER FOR 22 YEARS.

61

<i>Years.</i>	<i>March.</i>	<i>April.</i>
1813	1st. Rain and N. wester on the 10th; cloudy and sultry throughout. Hot winds.	North wester and two heavy falls of rain; occasionally clear weather and sultry.
1814	Hot winds from the 1st, and sultry throughout.	Early part very sultry. 14th. Heavy fall of rain and cloudy to the end. 25th, 26th and 27th, hot winds.
1815	Mornings and evenings cool; a slight shower on the 19th.	Frequent showers. Rivers rising on the 14th; cloudy to the end.
1816	Rain on the 2nd; sultry throughout. Hot winds furious.	Much rain this month; cloudy and sultry.
1817	Generally cloudy, some showers. Hot winds latterly.	Great proportion of hot winds, clear weather, latter part cloudy.
1818	Cloudy throughout; N. wester and heavy showers of rain.	Generally cloudy and sultry. One heavy shower. Hot winds.
1819	A slight shower on the 19th; cloudy to the end.	16th. First N. wester, much rain this month and cloudy.
1820	Hot westerly winds prevail; sultry and cloudy; first heavy rain, 28th. Thermometer 60° to 71°.	First N. wester 4th, seventeen days this month and 8 N. wester. Rivers very high. Rains set in 25th. Thermometer 76° to 90°.
1821	First N. wester 4th, first part showery, latter cloudy. Thermometer 65° to 78°.	Hot winds excessive this month; a slight shower on the 20th. Thermometer 71° to 88°.
1822	First part cloudy and sultry; latter stormy with rain. Thermometer 69° to 81°.	Two N. westers and rain. 14th and 24th, generally cloudy and sultry. Thermometer 76° to 88°.

# STATE OF THE WEATHER FOR 22 YEARS.

<i>Years.</i>	<i>May.</i>	<i>June.</i>
1813	Early in the month some rain and cloudy weather; latter part heavy rain. Rivers rising.	Rains set in 7th very severely; rivers high and country flooded on the 15th; showery to the end.
1814	First N. wester on the 1st; cloudy and sultry; first rise of the river 20th; very high 23rd; subsiding towards the end.	24th. Rains set in mildly; heavy rain 27th and 28th; cloudy and sultry.
1815	14th. First N. wester. Towards the end much rain. Rivers rising on the 21st.	Rain excessive this month, occasionally stormy; rivers high.
1816	Rain moderate; cloudy and sultry.	11th. Rains set in mildly, cloudy and showery throughout. Rivers rising on the 12th.
1817	4th. First N. wester. Frequent rain, not heavy. Cloudy throughout.	17th. Rains set in mildly; showery and cloudy to the end. Rivers rising 23rd.
1818	Sultry; two heavy showers; cloudy to the end.	Rains set in 15th, mild; occasional showers; cloudy and sultry.
1819	Showery throughout and some heavy rain, sultry weather.	Rains set in on the 1st. Rivers very high on the 4th; much rain this month; country flooded 29th. Thermometer 80° to 92°.
1820	13 days rain; country flooded on the 17th; clear and fine weather to the end. Thermometer 80° to 90°.	28 days rain; country flooded on the 17th, and again on the 24th; cloudy and sultry. Thermometer 80° to 90°.
1821	Generally cloudy; some heavy showers and 3 N. westers. Thermometer 80° to 90°.	Rains set in 20th very mildly. Cloudy and mild. Thermometer 80° to 86°. *
1822	Much rain this month; rivers rising on the 19th; cloudy and showery latter part. Thermometer 70° to 84°.	Rains set in with severe storms 10th; rivers over their banks on the 13th; and country under on the 30th. Thermometer 80° to 90°.

<i>Years.</i>	<i>July.</i>	<i>August.</i>
1813	Cloudy and sultry; rivers very low; towards the end rain.	Much rain this month; country inundated on the 20th.
1814	Very little rain this month. Rivers very low. Clear weather generally.	Frequent showers this month. Rivers very high on the 12th; latter part cloudy and sultry.
1815	Some heavy showers; cloudy and sultry.	Much rain this month. Weather sultry.
1816	Mild this month; cloudy with occasional showers.	Early part much rain. Rivers very high; cloudy and sultry.
1817	Rain moderate. Rivers within their beds, sultry; generally cloudy.	Early part showery; sultry and cloudy. Rivers low.
1818	Rain excessive this month towards the end. Rivers over their banks.	Some heavy rain; cloudy and sultry throughout.
1819	Showery throughout; rivers beginning to fall on the 4th; sultry to the end.	Rivers within their banks this month; a few heavy showers. Thermometer 84° to 92°.
1820	Much rain this month. Rivers very high; sultry throughout. Thermometer 79° to 91°.	Early part heavy rain; middle and latter cloudy. Thermometer 80° to 92°.
1821	Very sultry; occasional heavy showers. Rivers rising from the 15th. Thermometer 80° to 90°.	Much rain this month; rivers generally within their banks. Thermometer 81° to 90°.
1822	3rd. River falling; showery first part, cloudy to the end. Thermometer 80° to 86°.	Occasional showers with some heavy rain; sultry. Thermometer 80° to 86°.

<i>Years.</i>	<i>September.</i>	<i>October.</i>
1813	Sultry and cloudy this month.	Slight shower on the 8th and 17th; cold weather set in 24th. Cloudy.
1814	Early part showery; middle and latter cloudy and sultry.	Fine clear weather; cool throughout. One shower of rain only.
1815	Early part heavy showers; cloudy throughout.	Northerly breezes and cold weather from the 4th. A clear month.
1816	Cloudy and sultry, the latter part much rain.	Mornings foggy; northerly breezes; cloudy with occasional fair weather. Cold weather set in latterly.
1817	Occasional rain. Sultry; generally cloudy. Thermometer 80° to 90°.	Early heavy rain. Rivers high. Middle part stormy; cloudy and sultry to the end.
1818	Early part much rain; latter cloudy and close.	Two heavy showers; clear and cool to the end.
1819	Rain excessive this month, and country twice flooded.	First and middle parts rain; country once more flooded from the 25th; clear, and northerly airs.
1820	To the 20th much rain; to the end cloudy, with occasional sun. Thermometer 78° to 90°.	20th. Cold weather set in; a slight shower; northerly airs, and foggy mornings. Thermometer 72° to 80°.
1821	Rivers rising from the 1st; country flooded on the 5th; cloudy and sultry to the end. Thermometer 80° to 85°.	Heavy rain early part; country again flooded; from the 14th clear and mild. Thermometer 72° to 80°.
1822	Temperature increasing; cloudy. Occasional showers to the end. Thermometer 82° to 86°.	Mild and cloudy; mornings occasionally foggy; slight shower on the 18th. Thermometer 72° to 84°.

<i>Years.</i>	<i>November.</i>	<i>December.</i>
1813	Early part clear and cool; latterly cloudy and foggy; cold weather set in early.	Northerly winds and cool throughout.
1814	Cold weather set in 3rd; wind northerly; mornings foggy.	Foggy mornings; generally cloudy and cool throughout.
1815	Foggy mornings; cold weather set in; mild throughout.	Cloudy throughout, and foggy in the mornings.
1816	Mild weather; temperature increasing towards the end.	Northerly breezes; foggy mornings; cloudy.
1817	5th. First cold weather. 22d and 23rd, N. Westers and much rain; mild and cloudy to the end.	Very mild all the month; clear throughout.
1818	10th. Cold weather; foggy mornings and mild.	Cold increasing; clear weather throughout.
1819	Cold weather set in 1st; foggy mornings; clear and mild to the end.	Mornings foggy; northerly airs, and clear to the end.
1820	Clear and cool throughout. Thermometer 68° to 75°.	A cold month; clear in general. Thermometer 52° to 66°.
1821	Cold weather set in 4th. Northerly breezes and cloudy. Thermometer 64° to 70°.	Temperature increasing; hazy at times; cloudy to the end. Thermometer 54° to 68°.
1822	Cold weather about the 20th; generally cloudy; some days clear. Thermometer 66° to 74°.	

**XXII.—Method of treating the Grape Vine at Bombay.***By Mr. BALLARD.*

\* [Read May 16th, 1824.]

In Bombay we find the soil best adapted to the culture of the vine, to be a light sandy earth free from moisture. When the soil has in the first instance been of a stiff clayish nature, I have seen it much improved by trenching it to the depth of thirty inches, or three feet, and filling up with sandy earth, from the cocoa-nut woods, and the small white sea shell, in the proportion of two-thirds of the former, and one-third of the latter in alternate layers of each.

We prune towards the end of October, taking care as soon as the rains are quite over, to bare the roots of the vine completely in order to check vegetation, and give them a kind of artificial winter. Say that the roots are on an average opened about the 7th or 10th of October, they are allowed to remain exposed in the first instance for fifteen or sixteen days, when they ought to be pruned, leaving according to the strength and age of the vine, two, three or four shoots, with so much of the last year's wood as shall exhibit three or four healthy eyes, it being from these, that the bearing wood of the season is produced. As soon as these eyes begin to bud, which they generally do in about a week, (I think,) after pruning, the earth should be filled up around the roots, with a considerable quantity of manure, and the vines be regularly watered morning and evening until the fruit attains nearly its full growth and begins to swell and ripen, when it seems to be necessary to decrease the quantity of water, allowing the vines only such a portion as will keep them healthy, perhaps I should say watering, every third or fourth day.

Vines pruned at the season I have mentioned, generally yield fruit fit for the table about the end of January, and as we cannot expect them from the same vine to continue in perfection above a month or five weeks, we have latterly, and with great success, allowed a portion of them to remain

unattended to, till the month of November, and some few till December, when the same process takes place in their treatment, that I have endeavoured to describe above.

By these means we obtain a regular succession to the end of April, and sometimes till the middle of May. About a fortnight after the vines, which produce in January, have done bearing, say the middle of March, the roots are again bared, as in October, and the system of pruning, manuring, and watering, once more resorted to, but as two crops in the year would weaken the plants, and that the second one, could not attain perfection before the monsoon, we pick off all the promised fruit before it comes to any size, for once touched with heavy rain it loses all its flavour, and ceases to be of any worth.

The vines which have been pruned in November, of course produce about the end of February, and are similarly treated with the above, at the proper season. Of the later ones, which producing in March and April, would need pruning just at the commencement of the rains, I cannot speak with any confidence, though I think — who has been one of our most successful gardeners, told me, he had not pruned these more than once a year. It is only by experience that we gain any knowledge of the treatment of European plants in this country, and it may perhaps require another year or two ere we can satisfy ourselves, as to the comparative strength and healthiness of vines managed in the latter mode.

The change of seasons, is so similar in Bengal and Bombay, that I shall think the same kind of treatment adapted to both places, and it is more on this score, than any other, that I hope this memorandum may be useful, for of the scientific part of gardening, I profess my utter ignorance. A great deal of most valuable information regarding the culture of the vine and other fruit trees, is to be found in a work published by Forsyth, many years head gardener to the King, and which I have several times seen for sale in this place; I think it is entitled, "Forsyth on Fruit Trees."



**XXIII.—***On the cultivation of the Sugar-cane and manufacture of Sugar in Burdwan and Rungpoor. Communicated by G. BALLARD, Esq.*

[Read, May 18th, 1824.]

Of the annexed papers, the first is an estimate of the culture of Sugar-cane and the manufacture of Sugar from Jagree.

The second is merely a bare estimate of the charges incurred in the cultivation, and the quantity and ordinary value of the produce in Jagree.

In some respects they are both deficient, particularly that neither specify the size of the biga alluded to, nor in the last the description of maund. But they are still sufficiently explicit to shew that the return is ordinarily among the most profitable of any obtained by the labour of the Agriculturist, in the first instance; and of the manufacturer in the second.

The first paper was drawn up in Burdwan. It is minute enough as respects the culture of the cane—but commences the manufacture from the Jagree without stating how it is prepared, or how much under ordinary circumstances is obtained from a biga. The second furnishes the quantity of Jagree and its sale price, but omits any statement of the produce in sugar. It was drawn up in Rungpoor.

Until European capital and ingenuity are engaged in the culture and manufacture of Sugar it is impossible to conjecture how much the one or the other may be improved. Both are no doubt at present susceptible of great improvement. The poor ryot cultivates from half a biga, to four or five, seldom more, without skill or funds to improve or enlarge his cultivation; and with his imperfect mill incompletely expresses the juice of the cane at the corner of the field in which it has grown—inpressing it there into Jagree—which is kept for an uncertain period and often carried to a great distance before it is subjected to the process

which separates the chrystallizable portion from the vegetable syrup.

This intermediate process would of course in a regular manufactory be abolished, and it is possible that there would result a larger proportion of sugar, and perhaps that the sugar would better suit the refiner if the juice were by one uninterrupted series of boilings evaporated to chrystallization. I offer this however merely as a conjecture.

A place (Nauda Patua) is mentioned as a principal sugar manufactory in the Burdwan district—and it is said that 80,000 maunds are supposed to be manufactured there annually; which may be the produce of 8 or 10,000 bigas of sugar-cane, not more than the cultivation of a moderate-sized indigo concern at which from 4 to 500 maunds would be made in a favourable year. The agricultural outlay on one cultivation would be perhaps 25,000 rupees; on the other scarcely less than 3,00,000 rupees.

If the place above-named takes off a third or even a fourth of the Jagree of the district, it affords a probable estimate of the present extent of the Sugar-cane cultivation or about 40,000 rupees, not a fourth probably of the land capable of being so employed without displacing to any sensible degree the present culture.

G. BALLARD.

DEAR SIR,

I now beg to forward a statement of the expense of planting and bringing to maturity cane, as practised in this part of the country, according to the most accurate calculations I have as yet been able to make. Not being able to purchase standing cane, unless in small quantities, at extravagant prices, I believe the best way to make a fair experiment, will be to cultivate a few bigas for next crop. With this view I have fixed upon a place called Kurkana, not far from Saban, having water conveyance by the Saugur-khalee and Injillee rivers, to within one koss of the place, in the rainy season, and within four koss now. In this neighbourhood the cane

appeared strong, and averaged better than I had hitherto seen ;—from 20 to 50 bigas can be got here.

*Estimate of the expense of cultivating 50 bigas.*

	<i>Rs. As.</i>
1. Hocking 50 bigas, at 4 Rs. per biga, . . . . .	200 0
2. 15 kahuns of cuttings for planting each biga, each kahun is 19,500, 2 kahuns for 1 rupee, at 7 Rs. 8 As. . . . .	375 0
3. Planting the cuttings and watering, at 3, . . . .	150 0
4. Watering at different times, at 1 R. 12 As. . . . .	87 8
5. Weeding and cleaning, at 1 R. 4 As. . . . .	62 8
6. Manure procured from the bottom of tanks, at 4 Rs. . . . .	200 0
7. Binding the cane together and wrapping the leaves round them, at 5 Rs. . . . .	250 0
8. Watering in Oct. Nov. Dec. and January, at 3 Rs. . . . .	150 0
9. Cleaning the cane, pulling off the decayed leaves, &c. at 8 As. . . . .	25 0
10. Rent upon average (perhaps something less), at 5 Rs. 8 As. . . . .	275 0
11. Squeezing the canes if performed by the natives who take 16 days to a biga, at 13 Rs. . . . .	650 0
	<hr/>
	<i>Sa. Rs. 2,425 0</i>

This cane will produce a second crop, at little additional expense, and the cuttings will yield about 15 rupees per biga.

The above estimate may be a little more or less, than the real expense, but the respectable native whom I formerly mentioned to have employed for the last two years, engages that it shall not exceed this ; perhaps a few rupees, say sicca rupees 2,425.

From the several experiments I have made, and every information I can derive on the subject, I believe 12 bazar maun-<sup>1</sup>ls might be obtained from the biga. My headman

says he has seen 15, 18 and 21 maunds, but I think he is mistaken ; to keep within the mark, I shall say,

	<i>Rs.</i>	<i>As.</i>
8 bazar maunds, at 8 Rs.....	64	0
10 maunds of Molasses, per biga, at		
1 R. 8 As.....	15	0
Skimmings, washings, and refuse of the cane, at the most moderate computation, 30 gallons, per biga of Rum, at per gallon, 8 As. ....	15	0
Cuttings for planting, which can either be sold or used, if re- quired, in the cultivation of other ground, at 15, .....	15	0

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Sa. Rs. 109 0  $\times$  50 = 5450

Probable profit on 50 bigas besides the second  
crop, ..... Sa. Rs. 3025

At present I am at a stand in this quarter, being too late to cultivate, as I at first intended, and the scarcity of plants is so great, that they are not procurable. It will be infinitely more advantageous for me to pursue your plan of advancing periodically to the ryots, and it will be my business and study to adopt that system, for I candidly admit, that I am but a lame agriculturist, however much I may be anxious to improve myself in that science ; and I have not the smallest doubt but I shall be able to procure abundance of cane on the terms you propose.

I beg to inclose the last letter I got from my man at Soob-rajeepoor, wherein he mentions cane to be procured at 20 to 16 per kotta. On receipt of that letter I despatched my other sirkar and five of my best sugar people, with utensils and money, directing them to count, weigh, and average the canes on several kottas of ground, and if possible to measure the juice, and if they appeared to be as good, as those in this neighbourhood, to make advances for all they could obtain,

and if their first experiment turned out well, I desired him immediately to return to me, with an account of their progress, but cause the men to remain. Judge then of my disappointment and uneasiness, at hearing nothing from them for 12 days, but the distance is between 70 and 80 koss, and probably they could not make an experiment sooner, the factory being entirely demolished, and plundered, I principally regret, not being able to inform you of the results.

It is the black cane that is cultivated in this district, which produces a strong-grained excellent sugar for refining, and what I would send to England in preference to any I have seen, it has this remarkable quality that the Jagree may be boiled into sugar, without any previous preparation, all the other kinds of Jagree have to be drained in baskets, or squeezed in bags sprinkling a little water on it occasionally, to cause the molasses to separate freely, this I have often thought may be one of the causes of Kan in particular, and sugar from this country generally disappointing the refiner at home.

In the islands you will please to observe, that no other ingredient is used than quicklime and lime water, in the preparation of Muscovado; after it is grained, put into the hogsheads, and the molasses allowed to drain for about a month, the progress is finished.

At Nauda Patna, which may be called a colony of sugar-makers, where I am informed 80,000 maunds are annually made, they manufacture the sugar as follows:—The Jagree is mixed with a little water and clarified in a small earthen boiling pot, by adding milk diluted with water, from time to time, till it is clear; it is then passed through a cloth, and conveyed to another pot, when it is again boiled and further clarified with milk, till it acquires the proper consistency; it is now emptied a little at a time, into a small flat pan, is strewn over with a little fine pounded sugar and stirred about with a stick to cause it to granulate; thence it is poured into pots, having a hole bored in the bottom, which

is now plugged up; here it remains for three days to harden; the plug is then removed, and the molasses drains out; the crust is then taken off the top of the pot, and a sort of grass which grows in tanks, is put upon it, after which syrup is drained out; in two or three days the sugar at the upper surface gets white and solid, it is scraped out and treated as before, till the whole is finished: it is generally cut three or four times. The syrup, which is called tipkanee, is reboiled into sugar.

The sugar so treated is dried in the sun and beat with large sticks, to cause it to look whiter, but to the destruction of the grain. The Jagree of other districts after being drained and pressed, is prepared with little variation in the same manner.

*Statement of the expenses attending the cultivation of Sugar-cane in the District of Rungpoor.*

FOR ONE BIGA.	Rs. As.
Malgoozarce, . . . . .	2 4
Ploughs, . . . . .	3 2
Coolies, . . . . .	3 2
Plant, . . . . .	3 0
Weeding charges, . . . . .	1 8
Ploughs, . . . . .	0 10
Coolies, . . . . .	0 10
Ditto, . . . . .	2 8
Ditto, . . . . .	0 15
Ditto, . . . . .	0 4
Expense of manufacture, . . . . .	6 0
Manufacturing hire, . . . . .	3 0
Pots, . . . . .	0 15

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Sa. Rs. 27 14

*Produce.*

*Value.*

30 mds. of grain Goor, at 2 Rs. 4 As. per maund,	67 8
Deduct expense attending the cultivation, . . . . .	27 14

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Balance, gain, Sa. Rs. 39 10,

XXIV.—*On rendering Flowers fragrant, &c.*

[Read Jan. 23rd, 1824.]

MY DEAR WALLICH,

I offer to our Society the accompanying original and translation of a curious work on Gardening, &c. which among much quackery may not be totally without use. It is at all events curious as shewing to what length credulity may go. I thought the work had been Raja Mitrajit's when I gave it to be translated.

Yours sincerely,

W. LEYCESTER.

*An Extract from a Botanical work.*

Take out the earth from the root of a tree which does not produce fragrant flowers, embrocate it with the bruised buds of jamun, motha and khus; and then fill it up with fresh earth; afterwards boil the same things in water, and when cool, water the tree with it; this management will render the flowers fragrant. This treatment applied to shrubs producing odorous flowers will increase their scent, and if applied to fruit trees will render the fruits sweet-scented; but it must be performed on young plants.

To change the colours of flowers, take a certain quantity of munjeeth, vermilion, alum, and pigeon's flesh, triturate them together with a sufficient quantity of cow's milk, and plaster the roots of the flowering shrubs with it, then dig out the old earth and put some fresh earth taken from a corn-field about the roots. Afterward, boil a quantity of turmeric, the blossoms of pulas, munjeeth and lodh in water, when cool, having mixed with it some vermilion, alum, and milk, water the plants frequently with the mixture, till they begin to bloom.

If the fat of horned beasts, cow's milk, munjeeth, and dried cow-dung be mixed with water, and plants that have fragrant flowers be watered with it, the fragrance will be augmented.

Dig a hole in the ground about  $1\frac{1}{2}$  feet deep and four in circumference, fill it with the bones of cows, and set fire to them and let them burn to ashes; after they are cool, you may boil the beef in water, and mix it with them that the ground may be moist, then plant in the hole any tree you want, and having laid in it fresh earth, water it with the same water. By this practice the tree will grow like a creeper and produce its natural fruits and flowers.

Take roots of nurgis, sousun, and shubbo, anoint them with ghee and honey, then tie them up together with untwisted thread, and having wetted them again with ghee and honey, plant them together in a good soil and keep the earth moist till they spring up. By this management they will after some time produce flowers of such various colours that nobody will perceive what kinds they previously were.

Take some slips or cuttings of rose trees and kuner, wet them in ghee and honey, and then having tied them up together in the same manner, rub the ghee and honey upon them and plant them in good soil; then let them be watered with sweet water. By this practice they will bring forth flowers of various colours. The slips of pomegranate trees may likewise be added to them.

If creepers be injured by worms, water them with water mixed with the dregs of sesamum seed.

When the leaves of a tree, or shrub, are injured by worms, sprinkle the ashes of dried cow-dung and the powder of the old bricks over them.

If the fat of a large snake and dhamun be boiled in water and sprinkled on creepers, it will cause them to produce fruits in abundance.

Vines will produce abundant fruit if the dung of hens be put to their roots, and they are watered with water in which sulphuree fishes and the flesh of horned beasts have been boiled.

To remove the diseases of vines, you should make a smoke under them with raisins, mustard seed, and sulphuree fish.



If young plants are smoked with ghee, baebirung, sugar and dried cow-dung, they will produce sweet fruits.

If a jak tree be watered with the juice of triphula, and the trunk of it covered with straw, it will bear large and delicious fruits.

If a ber tree be watered with honey and the juice of kyth mixed with jetheemud and sesamum seed, it will bear fragrant, sweet and large fruits.

Let the bark of the roots of jamun, lodh, and wheat be mixed with ghee and honey, and then the roots of plants be plastered with it, after which make a smoke near the root of the trees with sesamum, honey and wheat for twelve days continually. This practice will occasion the young trees of ber, burhul, amla, and jamun to produce sweet fruits.

If baebirung, mash, sesamum seed, mustard seed and bel fruit be boiled in water and orange trees be supplied with it, they will yield sweet fruits.

Let the shrubs of raebel and nagkesur be watered with motha, coagulated milk, sesamum seed, wine, cow's milk, and juice of kyth, and they will produce their fragrant flowers abundantly.

When the leaves of mulsuree plants begin to fall from the branches, tell a beautiful young woman to take little wine in her mouth, and throw it on the plant; or having gone to the bottom of the plant scratch it with her nails. By this practice it will bring forth plenty of flowers.

By watering the shrubs of parul with khus and cow's milk, they will produce abundant flowers.

### *Of seasons.*

There are six seasons in the year; namely, Shishira, containing Magha and Phalgoona; Busunt or spring, containing Chitra and Bisakha; Greeshma or summer, containing Jisthya and Asharha; Bursha or the rainy season, containing Shravuna and Bhadra; Surut or autumn, containing Ashwina and Kartika; and Hima or the cold season, containing Ugrahuna and Pousha.

In the month of Pousha, cover the plants of Raebel with straw or hay and set fire to them, then in the month of Phalgoona when the sun enters Aquarius, wet a quantity of khus in water, and having mixed it with cow's milk, water the plants with it every day in the evening. By this method, the plants will soon thrive and produce abundance of sweet-scented flowers.

If boiled rice be mixed with coagulated milk and sprinkled on garden beds, it will prevent the falling of hail on them.

*Of the diseases of trees, &c.*

The diseases of vegetables are of two kinds, natural and accidental; the former is that which proceeds from the tree itself, and the latter is that which arises from insects, frost, and other accidental circumstances.

Natural diseases are of three kinds: viz. bilious, windy, and phlegmatic. The symptoms of bilious diseases are the trunks becoming slender, the branches knotty and crooked, the leaves pustulous, and the fruits hard, dry and insipid. This arises from the dryness of the soil.

If the disease be windy the plants are late before they shoot, the colour becomes yellowish, the leaves crumpled, and the fruits small and insipid, though even continually watered. This disease is occasioned by too much water in the beginning of the spring.

By phlegmatic diseases the leaves become yellow, the fruits soon fall to the ground, and the plants appear in a decayed state, the fruits, flowers and leaves are withered and discoloured.

Accidental diseases are of three kinds: 1st, injuries to the roots of plants by insects; 2nd, injuries by fire, frost, &c.; 3rd, strokes of hatchets or other weapons.

The leaves of plants injured by insects, become yellow, and fade in the sunshine; they are often rooted up or broken in the middle by high winds and suffer a premature decay.

Plants are injured or destroyed by fire, frost, &c.

When wounded by a hatchet, or other weapon, the juice flows out at the place where they received the blow, the

trunks become slender and bear but few fruits. It must be observed that some plants get wounds without any apparent cause, and the juice flows out of them. This is occasioned by excessive phlegm.

*Of the cure of diseases.*

To cure natural diseases you must ascertain the manner in which the trees were planted and watered, and the quality of the soil, and proceed accordingly. If the cause of the disease cannot be ascertained, you must be careful to give moderate waterings to the plants. If the soil appears to be bad, you must transplant them at a proper season, and not deviate from the rules laid down. The flatulent, phlegmatic and bilious diseases proceed from the badness of the seeds, and the irregularity of the plantation. By the badness of the seeds the plants become barren.

Whether a plant have any particular scent or not, if the leaves grow crumpled, be assured either that ants have made their nest under it, or that it has been injured by excessive watering.

Let the flesh of horned animals, ghee, cow's milk, and sesamum seed be boiled in water and mixed together, with which water the plant which has been seized with a flatulent disease. By this management it will become green and produce fruit; also make a smoke at the bottom of it with the wood of nim, cow's horns, horse's hoofs, ghee, and the fat of a cat.

For phlegmatic diseases, you must take some bitter and pungent drugs, with straw, seed, and wood; let them be boiled in water, and then let radishes be boiled in cow's milk and mixed with the above water, with which the plant should be watered. In performing this work you must at first take out the earth from the root of the plant, and put in dry, fresh earth, then let a sufficient quantity of white mustard seed be well pounded and put to the root.

To cure bilious diseases, let some cool and sweet drugs be boiled in water, and mixed with cow's milk, jethaemud and mutha, then let the plants be watered, with it. After-

ward having boiled the triphula in water, mix it with honey, and keep the bottom of the plant moist with that water for some days continually.

Plants that have been injured by insects, will be cured by the following management.

Dig out the earth around the root of the plant, and cleanse it from all insects that may be found there, then put in fresh earth taken from a corn-field and water it with ghee, mustard, and sesamum seed, mixed with cool water in which bhulawa rice and cow-dung have been boiled, and mixed with cow's milk and the blossom, and juice of the kyth. You may likewise make a smoke near the plant with mustard seed, asafoetida, baebirung, tuj, long-pepper, ghee, cow's horns, bhulawa, and the flesh of pigeons mixed with the juice of kyth. By this the plant will be protected from worms or insects.

The plant which has been wounded by a hatchet, &c. should be plastered with well pounded baebirung, sesamum and mustard seed, mixed with ghee and a little cow's milk, and supplied with cool water and milk.

Plants which have been injured by frost or the sun, should be covered with straw and moistened with the water of kyth and cow's milk. By this treatment the plants will grow green if not totally dead.

### *Of lucky and unlucky trees.*

Toolsee, bel, anila, peepul, ber, nim, mango, goolur, muhooa, tamarind and kyth, are lucky trees. Ber, plantain, pomegranate and lime trees, unlucky.

The pear, khirnee, pomegranate, mour, plantain and jak trees should not be transplanted.

Bubool, kuchnar, lusora, urjoon and kurunjuwa should not be planted within the inclosure of a dwelling house.

No kind of thorny plant should be planted near or in the entrance of a house. The woods of thorny trees should not be used for the beams or other timbers of a house, as they are unlucky.

The ber tree on the east, pakur on the north, and goolur on the south of a house are auspicious. No tree should be planted in the gateway to a house though it should produce gold; and in the outside of a court, trees should be planted in such places that the shadow of them may not fall on the house.

*Of the garden.*

The garden should not be made towards the south, south-east, or south-west of the dwelling house; but it is good to make it on the north, west, or east.

*Of the soil.*

There are three kinds of land in every country; 1st, Jungul, where the water lies too far from the surface of the earth; 2nd, Unoop, where water may be found near the surface; 3rd, Suman, neither one or the other.

Earth is found of six colours, having different tastes and qualities; namely, 1, black and sweet; 2, almond-coloured and sour; 3, wheat-coloured and salt; 4, red and sour; 5, white and bitter; 6, yellow, which is hurtful.

Fruit trees and flowering shrubs should not be planted in a poisonous and stony ground; and in places infested with snakes, mice and other pernicious animals, nor in salsuginous ground, nor in the water of wells, rivers or tanks, in which the plants will not take root; but they should be planted in soft ground, where the grass is green. In such ground the trees soon grow.

In a country where water is deficient, kuthul, burhul, lemon, bamboo, jamun, ber, kadum, khoorma, jaephul, sooparee, plantain, grape vines, cocoanut, bel, byr, usok and ketakee trees grow very well; and in a country moderately watered, deodar, pomegranate, &c.

If a tree be seen growing in ground different from what has been above mentioned as its proper soil, it must be supposed either that riches are buried under that tree, or that the grave of a saint or religious man is there, or that the master of the ground is just and virtuous, or that the person who planted it employed great care about it.

*Of fruit trees.*

Fruit trees are of four kinds; 1st, *bunusputi*, which bear fruit without an apparent blossom, as *goolur*, *ber*, &c.; 2nd, *droomu*, which produce fruit subsequent to blooming, as *mango*, &c.; 3rd, *luta*, or creepers, which are supported by another tree, as *cucumber*, *kudoo*, &c.; 4th, *goolma*, from the root of which proceed small branches, which are equivalent to its fruits, as *sugarcane*, *betel*, &c.

Some plants are propagated by seeds or kernels, as *mango* trees, &c. some by planting slips or cuttings, as the *rose*, *betel leaf*, &c. and others both by sowing the seeds and planting the cuttings, as *pomegranate*, *kuner*, *pakur*, *ber*, &c. and some are propagated by sowing the seeds or planting the roots, as *neclofur*, &c.

*Of planting and sowing.*

The fresh seeds of ripe *mango*, *jamun*, and *kuthul* should be planted in a good soil. Let the fresh and dry seeds be washed with cow's milk, and then having mixed them with cow-dung, dry them in the sun, afterward let them be kept for seven days in honey with which well pounded *baebiring* is mixed, and then sown.

Another way is to steep the seeds in cow's milk for five days, and after drying them in the shade, to mix them before planting with ghee, *sesamum seed* and the ashes of *bhut-kutae*.

It is an advantage to break the points of some seeds, as those of *khirnee*, *neclofur*, *cucumbers* and the like. Such seeds should be steeped in molasses and buried under a fire-place after having wrapped them up in the leaves of any tree. Three days after taking them out sow them in good soil, cover them with straw and give them a watering when they begin to grow; the straw must then be taken away and the earth kept moist.

*Propitious times for sowing and planting.*

The fourth, eleventh, twelfth, and thirtieth of every lunar month, and Monday, Wednesday, Thursday, and Friday, are

propitious times for sowing and planting, but it will be better if the dates agree with the days.

In planting *droomus* a space of twenty cubits should be left between the trees, for each is best; some plant them at sixteen, and others at only four cubits distant, which is a bad practice. At a less distance than this the plants will not grow well.

Five cubits is the proper distance for *goolmas*; four may do, and some plant them at only three cubits distance; but they should not be planted nearer than this. *Lutas* or creepers should be planted in the same manner.

For a plantation the ground should be prepared in the following manner: First dig the holes about  $1\frac{1}{2}$  feet deep and four in circumference, and let them remain a month to dry; afterward fill them with small pieces of dried cow-dung and cow's bones, which burn to ashes; afterward having taken out the ashes, cleanse the hole and moisten it with the water of kyth. When the hole becomes dry, fill it with the fresh earth of a corn field. The plants of mango, pomegranate, *kudoo*, &c. thus planted will grow well, and produce large and sweet fruits.

Herbs should be planted in beds, previously prepared in the manner directed for cucumbers. The seeds of oranges and lemons should be put in the mouth before they are sown.

If the seeds of plants are rubbed with the pith of ripe plantains, dried in the sun and laid in straw, and afterwards sown in beds prepared as above directed, and watered with well water, the trees will grow large.

Garden herbs should be planted in small beds made like those intended for saffron. The slips should be about eighteen inches long, taken from the hard and strong branches, and planted in the following manner: First dig a hole about one cubit deep, fill it up with earth mixed with an equal quantity of cow-dung or compost, then let the slips or cuttings be put into the earth about one-third of their length, and supplied with well water mixed with tindol earth.

The slips or cuttings of sewtee should be planted like those of sugar-cane and watered; after two months they may be transplanted when they will blossom well.

If plants of pomegranate and kumer grow in the same place, lay the branches of both into the ground only leaving the top of every branch above ground, and water them; when they take root and new leaves begin to appear, cut them off from the mother plants and leave the two branches to grow together, when they will produce flowers of various colours.

If young plantain trees be planted like slips and watered, they will produce large and sweet fruits.

In transplanting trees it must be observed, that they be young and their roots should be anointed with honey, mixed with the seeds of neelofur, ghee and baebirung.

Mango, kheernee, pomegranate, and mulsuree trees planted in the month of *Shravana* when the sun enters *Cancer*, grow very well. Mango and burhul trees in the month of *Bhadra*; in *Ashwina*, badunjan and vegetables; in *Kartika*, coriander; but nothing should be planted in *Ugrahuna*, *Pousha*, and *Magha*. In the month of *Phalgun*, pulwul and other vegetables of the like nature succeed; in *Chitra*, cucumbers, water-melons, khurboozes, and sugar-cane; in *Bisakha*, plantain trees, and in *Jisthya*, trees, plants and shrubs of every kind grow very well. They must be kept in the same place if the soil be good; otherwise they should be transplanted into ground prepared as above stated.

Nim trees should be planted about the garden, as the other trees in it receive great advantage from them.

When a person intends to make a garden, he should first plant the five lucky trees, namely, bhela, usok, deodar, siris and nim, after which he may plant any tree he pleases.

The following trees should be planted in trenches on the four sides of the garden, viz. karunda on the east; bamboos on the south; ber and kyth on the north; and amla and bel on the west.



For the better cultivation of trees, it is directed in the original work, that the trees should be anointed with the dregs of sesamum seed and bæbirung dissolved in water, and that young plants be watered with cow's milk mixed with water, and also with the water of the kyth; and some smoke should be made under the young plants with the dregs of sesamum seed and ghee. By repeating this work two or three times, the plants will become strong.

Let small fishes, the flesh of horned cattle, and black sesamum seed be boiled in an earthen pot with water, and the young plants watered with it till they have been planted a week; the ground also should be prepared by sprinkling it with such water.

Trees which have been transplanted, should be protected from the sun until new shoots and leaves come out; they should be watered every day in the morning and evening, but not in the day time while the sun shines.

#### *Of watering.*

In the *Jungul* ground the plants should be supplied with water fifteen days every month; in ground where water is scarce five days every month, but one day in the evening and the other in the morning alternately. Care should be taken to water moderately. But if *Jungul* and *Unoop* ground be mixed together, let the plants be watered moderately twice a day for ten days every month.

In the month of *Ugruhuna* old trees should be watered every other day. In the months of *Chitra* and *Bisakha* every day in the evening, and in *Asharha* and *Jisthya* three times every day.

Old trees should be watered every other day in the month of *Ugruhuna*, every day in the evening in *Chitra* and *Bisakha*, and three times every day in *Jisthya* and *Asharha*; but in the months of *Shravuna*, *Bhadra*, *Ashwina*, *Pousha* and *Magha*, or in the rainy season and winter no water is required.

If a tree be broken in the middle, or a branch twisted by a storm or high wind, but the tree still standing, let the

injured part be plastered with ghee, wine, and cow's milk, with which the well-pounded bark of pakur and goolar have been mixed, and wrapped round with straw plastered with the same composition, and tied up strongly. Let the old earth be taken from the roots and fresh earth put in, which should be moistened with buffalo's milk and watered with cool water.

If a tree is injured by fire or frost, it should be rooted out, as no preparation would have any effect on it. If, however, it be not totally dead, and appear green take out the earth from the root and put in fresh earth; water it with water mixed with cow's milk, and make a smoke about it with tortoises and crabs. By this preparation it will most probably become green.

The same process will have a good effect on trees which have been withered for want of water.

Besides these, plants are sometimes seized with the disease called pendoo, by which the leaves become yellowish, and the plants remain always in the same state both in spring and winter. The trunks and branches of such plants should be anointed with ghee and clay taken from a tank mixed with baebirung, and their roots should be moistened for seven days with water mixed with cow's milk, honey, and well pounded wheat, and barley.

Trees which do not yield fruit, or which become barren, should be watered for a week with the water of kyth mixed with cow's milk; or having boiled sesamum seeds, wheat, koorthee, mash and mooug in water, let it cool, and then give them a watering with it for a week.

When a tree is injured by too much water, dig out the earth from the root, and having scratched all the roots with your nails, plaster them with honey mixed with well pounded baebirung, then put in fresh earth and give them refreshment with cool water.

To cure all diseases of vegetables such as badanjjan, khyar, kudoo and herbs, &c. you must make a smoke in the field

with cow's and cat's bones and cat's dung which will also destroy worms and insects.

The above operations are most successful on young plants, but for old ones the medicines already mentioned should be administered, and if they prove ineffectual, you must transplant them into other ground prepared as above directed.

*Some curious operations directed in treatises on gardening.*

Steep the kernels of ripe mangoes in the fresh fat of rabbits for a month, and then let it be dried in the sun, afterwards plant them in ground prepared for that purpose, and watered with the water of kyth and baebirung as above directed. By this treatment the trees will yield fruit through the whole year.

If young plants are supplied continually for a month with the juice of sugar-cane mixed with the dregs of sesamum seed, baebirung and beef, they will produce fruit in the course of a month.

The earth should be dug out from the roots of trees producing sour fruit and the place filled with the lotus neelofur, honey, molasses and jetheemud, after which fresh earth should be put in and watered with water in which the above articles have been boiled. By this practice they will yield sweet fruits.

Take off the bark from the roots of trees which produce bitter fruit and plaster them with cow's milk mixed with baebirung; then let baebirung, jetheemud, wheat and molasses be boiled in water and the trees watered with it. By this treatment they will produce sweet fruit.

Likewise if the roots be plastered with muhooa, honey, jetheemud, dakh, molasses and wheat, and watered continually, they will yield sweet fruits instead of bitter ones.

If the roots of fruit trees be plastered with well pounded triphula, wheat and mango kernels, and watered with the prepared water, in which the above articles were boiled, the fruits will be of a black colour.

In like manner, if the roots be plastered with wheat, pulas

flowers, munjeeth, huldee, and sesamum seed and regularly watered, the plants will produce red fruits.

If the roots be plastered with the mixture of the bark of seemul, huldee, bel, triphula, dried cow-dung, and wine, and watered, the fruits will always remain of a verdant green even when ripe.

Make a hole in the ground about a fathom deep, and fill it with bricks, then set in it a young plant. This tree will not grow high, but will yield fruits as large as it naturally would do.

If you intend to make a naturally large tree grow as a dwarf, let all small shoots be pruned off and the wounds scorched with a fire brand; then let all the branches be plastered with a mixture of ghee, cow-dung, rock salt and honey, afterwards make a hole in the root and put a wooden peg in it, then put in the earth and keep it moist with water and milk. In consequence of these operations the tree will become dwarf.

Make a hole in the root of a tree and put into it the tibia or bone of a horse's leg dipped in the juice that flows from an elephant's temples; this will cause it to produce fruit all the year.

If the roots of a vine be pierced in two or three places with a golden pin, made hot in the charcoal of the powder of ivory, it will produce large fruits in abundance.

If the seeds of a plant are softly rubbed every day with the oil of the seeds of *lusora* distilled by the *patal juntra*, kept in the air at night, and dried in the sun by day, and repeated a hundred times, and afterward planted in a good soil and kept moist with rain water, the plant will spring up and bear fruit the same day.

If the seeds of water-melons, cucumbers, and the like, be set in tubs and kept moist with water mixed with the dregs of sesamum seed and the flesh of horned cattle, they will produce fruits as large as a water pot.

If cucumbers and petha are sown in the same place, and when they grow up, twisted together, and kept wet with

honey and ghee and afterwards wrapped round with straw and plastered with cow-dung, the stems of both will, in a few days, be joined together, after which if the plant of the petha be cut off, leaving the cucumber, it will produce fruits as large as a petha.

Having anointed some seeds of water-melon with honey and ghee, put them into an unripe petha growing on the plant, through a hole made by cutting out a piece out of it, then let the hole be filled up with ghee and honey and plugged up with the piece which has been cut out. Then fastening it, by plastering it with ghee and honey, leave it till it becomes ripe. Afterwards taking the seeds out of it, sow them in good soil; this will occasion them to produce large fruits with but a few seeds in them. But you must take care to keep the bed moist with water which is mixed with the dregs of sesamum seed and the flesh of horned beasts.

If the seeds of neelofur be preserved in the dried fresh dung of buffalo for a week, and then sown in beds, keeping them moist with rain water, they will produce red flowers like those of kũner.

If the stalk of a water-melon be laid in the ground and divided from the plant after it has taken root, and this be repeated three times, it will produce fruits without seeds.

If the slough of a large snake be filled with the dung of peacocks and put into the mire of a tank, plants of neelofur will grow from it; but you must keep it moist with rain water in the dry season.

*A list of the Hindee and Persian words.*

Amla, *Phyllanthus emblica*.

Baebirung, *Embelia ribes*.

Ber, *Zizyphus jujuba*.

Burhul, *Artocarpus Lacucha*.

Bel, *Egle marmelos*.

Bhzlawā, *Semecarpus anacardium*.

Bũr, *Ficus indica*.

- Babool**, *Mimosa arabica*.  
**Badunjan**, the egg plant, *Solanum melongena*.  
**Bhutkataee**, *Solanum jacquini*, Willd.  
**Dakh**, grape.  
**Dhamin**, a kind of serpent.  
**Deodar**, *Uvaria longifolia*, also *Pinus longifolius*.  
**Goolur**, *Ficus glomerata*.  
**Jamun**, *Eugenia jumbolana*.  
**Jetheemud**, *Liquorice*.  
**Jaephul**, Nutmeg.  
**Kuner**, *Nerium odorum*.  
**Kuthul**, the jak tree and fruit, *Artocarpus integrifolia*.  
**Kyth**, *Feronia elephantum*.  
**Kuchnar**, *Bauhinia variegata*.  
**Kurunjuwa**, *Galendupa arborea*.  
**Kudum**, *Nauclea orientalis*.  
**Ketukee**, *Pandanus odoratissimus*.  
**Khus**, *Andropogon muricatum*.  
**Kudoo**, *Cucurbita lagenaria*.  
**Kuronda**, *Carissa carandas*.  
**Koorthee**, *Dolichos biflorus*.  
**Khirnee**, *Mimusops kauki*.  
**Khoorma**, a date, *Phoenix dactylifera*.  
**Khurbooza**, a Muskmelon.  
**Lodh**, *Symplocos racemosa*.  
**Lusora**, *Cordia myxa*.  
**Motha**, *Cyperus rotundus*.  
**Munjeeth**, *Rubia munjistha*.  
**Mash**, *Phaseolus max*.  
**Molsuree**, *Mimusops elengi*.  
**Muhooa**, *Bassia latifolia*.  
**Moong**, *Phaseolus mungo*.  
**Mouz**, a plantain.  
**Nurgis**, a narcissus.  
**Nagkesur**, *Mesua ferrea*.  
**Nim**, *Melia azadirachta*.  
**Neelofur**, the lotus nilufer, *Nymphaea lotus*.

**Pulas**, *Butea frondosa*.  
**Parool**, *Bignonia suaveolens*.  
**Peepul**, 1, Long-pepper ; 2, *Ficus religiosa*.  
**Pear or peal**, *Chirongia sapida*.  
**Pindol**, a kind of white earth.  
**Palwul**, *Trichosanthes dioica*.  
**Petha**, a kind of gourd.  
**Raebel**, *Jasminum zambac*.  
**Shawbo**, *Polianthes tuberosa*.  
**Sousun**, *Iris*.  
**Supharee**, a kind of small fish, *Cyprinus sophore*.  
**Sooparee**, *Areca catechu*.  
**Sewtee**, *Rosa glandulifera*.  
**Siris**, *Mimosa sirissa*.  
**Seemul**, *Bombax heptaphyllum*.  
**Tuj**, *Laurus cassia*.  
**Toolsee**, *Ocimum sanctum*.  
**Triphula**, the three myrabolans.  
**Urjoon**, *Pentaptera urjoona*.  
**Usok**, *Jonesia asoca*.

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# XXV.—*On an improved Plough.*

[Read May 18th, 1824.]

MY DEAR SIR,

I beg to lay before the Society a short extract from a letter, which I lately received from my friend Mr. Cahill, of Tirhoot.

“ I am using a Plough made after the manner of Beattsou’s cultivators, it goes upon four wheels, and has six shares, each nine inches broad, and is drawn by four bullocks. I sow a space equal to five English acres per day, it is admirably adapted for land that has grass or weeds in it, as every one of them are removed, which would not be the case with the Hindoosthanee plough, and the four bullocks do as much work as THIRTY would do with the usual ploughs.”

This communication appears to me, to afford the Society an opportunity of becoming practically useful in the country, by promoting the introduction of an implement, so much superior to that in common use.

I suggest therefore, that Mr. Cahill be requested to state, if on further trial, he still entertains the same opinion of its advantages, and in that case to undertake the construction of ten, or fifteen (as the expense may be), at the cost of the Society, and to distribute them widely over the district among ryots who may be willing to accept, and give them a fair trial.

By such means the use of the plough may be familiarized; and by employing local mechanics in the construction of the implement, the demand which may be expected from such an experiment, will be more readily supplied. If the suggestion is adopted, its execution cannot be entrusted to better hands than Mr. Cahill.

Yours sincerely,

G. BALLARD.

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XXVI.—*On the cultivation of Sugar-cane and the manufacture of Sugar in the Ghazee-pore district.*—Communicated by G. BALLARD, Esq.

[Read July 13th, 1824.]

The soils best adapted for Sugar-cane, are light clays, denominated Mootéarée or Doansa, according as there is more or less sand in its composition.

The ground should be broken up and ploughed occasionally from the setting in of the rains until the middle of Phalgoona (beginning of March), when the planting commences, and is generally completed by the middle of Chitra (end of March). Pieces of cane from 9 inches to a foot long, containing six or eight knots, are laid in the furrows about a cubit asunder. The best sort of cane is called Khara, the second Boorlee; besides which there is a variety of



inferior species ; the former only are employed for the manufacture of sugar ; the juice of the latter is inspissated into goor and consumed in domestic uses in that shape.

The cane is not much liable to be affected by the weather, but it requires care in cleaning, tying up and fencing.

It is fit to cut in Pousha (middle of December), and the sooner it is finished the better. The juice is supposed to be thicker at this period and the sugar to form in better grain than when it is prepared in the hot weather.

The manufacturing apparatus is of the rudest construction, a mill not costing above five or six rupees, and an iron boiler costing sixteen or twenty according to its size. The bullocks to work the mill must be of the strongest description, and if the manufacture is extensive four pairs to work night and day are requisite ; such cattle cost about 15 rupees each.

The operations of the manufacture employ six men, who if hired labourers, receive each from 2 Rs. 4 As. to 2 Rs. 8 As. per month, besides an allowance of a little juice for their own consumption.

Sugar-cane land pays rent in the different purgunnas from six to nine rupees per biga, and the expense of cultivation is about thirteen rupees where irrigation is used ; where it is not, the expense will not exceed eight rupees ; altogether it may be stated at from twenty-one to twenty-two rupees ; thus—

	<i>Rs.</i>	<i>As.</i>
Rent, .....	8	0
Ploughing ten times, .....	2	8
Hoeing eight times, .....	2	0
Planting, nine days' work, .....	9	0
Cuttings, .....	2	8
Watering three times, .....	6	0
	<hr/>	
	30	0

From a well cultivated biga and a favourable crop sixty mards of goor are produced. This the ryot sells to the sugar boiler at from 20 to 25 seers per rupee.

Good goor yields one-third of its weight of the best cheenee; of the residue two-fifths will be produced of a second sort of cheenee called Doem; one-third yields molasses, and the rest is lost in the process.

Estimate of return to the cultivator—96 Rs. per biga.

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XXVII.—*An Agricultural memoir of the Poornea district, compiled from materials furnished by C. U. BLAKE, Esq. Presented by G. BALLARD, Esq.*

[Read Jan. 11th, 1825.]

#### PART I.

Of the climate of the Poornea district little can be said which does not apply generally to the whole of Bengal, its position with regard to the Hill country that bounds it, and the broad belt of forest which marks its confines on that side, have probably some local influence, but this is not materially operative on its agricultural products. It is damp, and has its full proportion of rain, with a prevalence, from May to October, of easterly winds loaded with humidity to a degree which, towards the eastern and northern divisions, moistens finely tilled light soils sufficiently to fit them for the reception of seed. Fogs are during the cold weather frequent. In the hot months the air is dry, and from March to May there is a prevalence of dry hot westerly winds. These are succeeded by wind from the east and north-east producing heavy rain. But if it veers to the south or south-east there is generally clear weather.

#### *Levels.*

The levels of the country as they affect its agriculture, may be divided into those which are open to annual inundation and those which are not within the reach of this benefit. A line traversing the district from east to west through the town of Poornea will mark the respective limits with sufficient accuracy—to the south of it the country is very generally submerged by the ordinary annual overflowing of the rivers;

to the north, it is very partially flooded. There seems a gradual descent from north to south from the hills which border the Morung to the Ganges. Most of the streams which cross the district in this direction pass through the first part of their course in deep beds with high defined banks, and as they reach the southern extremity towards the Ganges into which they are disgorged, widen, lose their mark or boundaries and approximate more to the general level of the country. The rise in these streams is often sudden and rapid, spreading with devastating velocity over the low tracts within their immediate vicinity.

*Soils.*

The soils also, as regards agriculture, and consequently as they are found on or near the surface, are either a stiff tenacious grey-coloured clay, which when flooded retains the water for a considerable time, and when dry cracks into wide fissures; such lands are fit for rice only, and it thrives on them so luxuriantly as to render the exclusive appropriation to this important grain not less a matter of interest than of necessity. 2. Clay of the same description, mixed with various proportions of fine attenuated sand, quite unadhesive and irretentive of moisture. Such tracts if open to inundation are very fertile and yield abundant crops of rice, indigo, or any grain common to the district; in favourable seasons they do well when in the higher levels, but cannot be cultivated in such situations with advantage for more than three or four years consecutively. 3. Rich black vegetable mould with a small proportion of clay and sand. These, like the last described, are of a light texture; but lying in the vicinity of the rivers and little raised above their level in the dry season, are always moist and suited to any crop. From their liability however to early inundation and the slow secession of the water, they can seldom be appropriated to any thing but rice or indigo. 4. Sandy soils to a degree which in their natural state unfits them for tillage. These constitute the high grass plains, on which during the rainy and cold weather months fine pasturage is obtained for the

numerous herds of horned cattle. The spots which have served as penfolds, having become thereby enriched, are the only spots of cultivation.

If the line assumed to mark the general levels, be intersected by another passing through the district from north to south, it affords a division by which the characters of the lands may be easily distributed. 1. The south-western quarter is the richest land of the district. It consists almost entirely of the second and third enumerated qualities of soil, and is very generally inundated by the great Koosi. In the widened bed of this river and its immediate vicinity, the light rich mould always moist is not less suited for indigo than for rice. Further inland there is a predominance of clay which renders the ground proportionately more retentive of water and consequently fitter for rice, to which indeed it is almost exclusively appropriated. The spots above the reach of inundation are more sandy, which it may be observed seems the natural earth of the country, vegetable mould and clay being deposited more or less abundantly, and in different proportions according to the influence of natural causes. On these high spots however with occasional fallow and a rude sort of manuring, fine crops of wheat, barley, mustard and similar crops are produced, occasionally also rice, but for indigo they cannot be made to answer. The average rent of land throughout this division is *one rupee four annas per biga of eighty cubits*. 2. The south-eastern portion, with the exception of so much as is within the reach of the Ganges, consists of the first and fourth qualities of soil. In the former rice, particularly that which is transplanted, thrives well, but nothing except rice; in the latter there is little cultivation and that in isolated patches, so that this quarter is far from being luxuriant or populous. Owing perhaps to something in the general level, the streams which traverse this part of the district overflow very suddenly and with a strong current, whence the heavier portions, which subside most rapidly, of the matter they bring in suspension, are deposited and are mere

sand or less fertilizing matter. The average rent here is from seven to eight annas the biga. 3. The north-eastern quarter is, generally speaking, of the first and second qualities of soil, and not liable to inundation from the rivers by which it is intersected; in low tracts the rains flood the lands, and where the upper stratum is clay remain for a considerable time. Nothing but rice will do well in such tracts, but on the high lands where the soil is naturally good, and where some pains are bestowed in its preparation, they produce besides the usual grain, ginger, turmeric, hemp, part of which gunnies are made, sugar-cane and very fine tobacco; the castor-oil tree also thrives and is abundant. Here the average rent of land is about twelve annas the biga, but the extremes are greater than in any other part, being from half a rupee to even three rupees. 4. The north-western division including also the northern limit of the former, is the least cultivated part of the district; its extensive high and sandy plains afford, however, as has been said, for some months pasturage for numerous and valuable herds of dairy and breeding cattle, and a few spots fertilized as was before mentioned, by being made their night-folds, are cultivated. The average rent is proportionately low or about six annas the biga.

Centrically where these supposed divisions meet, they of course participate in a common character, which is that of a low swampy level with a thick stratum of clay in which the transplanted rice thrives, but nothing else.

The general appearance of the country to the eye is not pleasing; flat and monotonous without being well wooded. The cocoanut tree is not there; the palm and date are rare. Bamboos as abundant as in Bengal. Mango groves as frequent. The baobool, tamarind, peul, and other trees common to this part of India are thinly sprinkled, while the noble timber of its bordering forests seem not to have ever strayed beyond the line to which they now reach.

These however are not points which effect its agricultural capabilities. In these it is in fact rich, for it possesses such

a variety of soil and surface as fits it in some part or other of its extent for every description of produce common to Bengal, and at the same time offers such an almost uninterrupted opportunity for the employment of the plough as enables its ryots to keep a large extent of land in tillage with very limited means.

*Circumstances of the ryots.*

Notwithstanding the advantages naturally belonging to this district, the mass of its labouring agriculturists are miserably poor and needy. It exhibits, not singularly perhaps above its neighbours, as its general characteristic, a numerous but indigent peasantry, conducting with ill-conditioned cattle and imperfect implements, an inartificial system of husbandry; yet an husbandry from which through natural advantages, the returns are abundant and in demand equal to the supply, and in which the rent of land, including some irregular charges imposed in its collection, does not absorb an inordinate proportion of the gross produce.

This lamentable poverty of our cultivators has not escaped notice, but until it is considered in conjunction with the actual capabilities of their trade the very peculiar features of the case are not seen. It is too complex a subject to obtain on this occasion all the investigation which it merits, but the record of even imperfectly supported opinions may serve to open the subject to the Society and invite its further discussion.

The immediate cause then of such remarkable poverty under such circumstances is, apparently, the terms on which the husbandman obtains the means of carrying on his business, and it is conjectured that the cause of his invariable dependence on borrowed funds and consequent unavoidable exposure to exaction is the very small scale on which his business is conducted.

It is a fact that at the present period the labouring farmer pays from thirty to forty per cent. interest for the money he takes up to meet the instalments of rent and other purposes requiring ready cash,—and further that he is compelled to

provide for the repayment of such loans by an hypothecation of the growing crop at the lowest or harvest price of the particular produce. This condition, it will be observed, involves a sacrifice of the only source from which the pressure of the exaction in the matter of interest might be mitigated, that is the advantage of the market—and his share of the fruits of his industry is limited to a bare subsistence. He gets, to use the language of political economists, just the *wages of labour*, and those too unfortunately of the lowest scale, or what Ricardo terms *the natural wages of labour or just enough to keep the race in existence*.

Immemorial usage seems to have naturalised this system, and in process of time there has arisen such an implication of cause and effect that one is tempted to sit down contented to allow *that they borrow because they are poor, and they are poor because they borrow*. Something places the occupation of capital among these people beyond the reach of the ordinary curative process, rendering its value stationary. The great change which has in all other situations taken place during the last thirty years has not produced the slightest modification of the terms and conditions of the ryot's dealings with his mahajun. Mr Colebrooke's statement published in 1794 is as far as it goes perfectly applicable to 1824, and has been so at all intermediate periods.

In the midst of the perplexity however which marks this curious state of things, the small farm system may be perceived producing an exceedingly mischievous effect; if it be not, indeed, the sole perpetuating cause of the evil. It will here probably be recollected that much has been said in favour of small farms in Britain, but besides that the scale there alluded to is colossal compared with that we have to do with, there are other causes which materially modify the question in its local application. With nine-tenths of our cultivators the annual land rent and its attendant charges, varies between thirty and sixty rupees. There are some even smaller farms, and some, of course, larger, but a majority approximating at least to what has been stated will

be found within the given limits. From fifty to a hundred rupees more will fully cover all remaining disbursements including household expenses. From one hundred to one hundred and sixty rupees is the whole annual disbursement, then, both in the trading capital and subsistence of an immense majority of your agriculturists.

In this very diminutive scale of operations, considered as regards the occupation, there are many disadvantages. First, it is a fact more easily understood than explained, that the *net gains* of a small capital are less *in proportion* than those of a large one. The man who employs a thousand will *cæteris paribus* clear more than ten times as much as he who only employs a hundred. But this diminution in the proportion of gain is by no means compensated by any counterbalancing diminution in his liability to loss—for the epidemic which destroys the cattle, or the inundation which sweeps away the crops, do not in their progress measure the mischief by the ability of the sufferer to bear it. Secondly, the returns of agriculture, as of any other trade, being necessarily limited by the extent of the outlay, there can remain from the produce of a very small farm, after subsisting the occupant and replacing the casualties and consumption of stock, but a very small surplus. But it is on the accumulation of this surplus that he depends for any improvement of his condition, and the progress of this desirable object must under the most favourable circumstances be tardy, if at all attainable against the ordinary checks to which it is exposed.

These disadvantages, it is affirmed, are inseparable concomitants of small farms, and to whatever extent they prevail, to an equal extent must this deteriorating influence have effect; and it is assumed that this is in Poornea and throughout Bengal generally sufficient to perpetuate the impoverished condition of the peasantry.

Much of what might and probably would have been said on the present occasion will be found better said in the 8th Number of the quarterly series of the "Friend of India,"



paper on the agricultural classes. But in one respect the opinions of the writer and those which are here advanced are in direct opposition.

He says, speaking of agricultural servants—"This class however is far from being numerous, they are in general much fewer than the *grihusthas* or *ryots*, the spirit of the country and the habits of the people leading them to prefer cultivating a small portion of land held in their own names, amidst all the difficulties they often have to encounter, to remaining thus in a state of servitude. In this temper which cannot be too much nourished we may discover the germ of an independent, industrious and happy peasantry, were circumstances as favourable to its development as they are in Britain." The accuracy of this discovery appears questionable; it may well be doubted, at least, whether the temper which cannot be too much nourished as containing the germ of industrious independence is not itself the genuine offspring of indolence, and like the poverty we have been deploring, at once a cause and effect of the demoralised character of the people.

However this may be, unless there exist some great deception, there would result, from an extinction of small farms, the effect, namely, that out of the present mass of impoverished and unimproving peasantry two classes would be created; 1, a class of farmers conducting the business on a scale of sufficient magnitude to place them within the reach of independence, of too much weight to be the victims of exaction, and offering, if one might use the expression, tangible objects of improvement; 2, and a class of independent labourers whose labour would be worth at least as much as that by which the soil is now cultivated, who would soon become better paid, and who would be free from the harassing responsibility which serves only to keep them in a struggle not less inimical to their comfort than to their moral character.

#### *Land Tenures.*

The *Zumeendar* is the known immediate proprietor of the soil, or without reference to the still disputed nature of right

in it, he is the cultivator or the party from whom the right of cultivating is directly or intermediately derived. He is however in fact generally speaking, very rarely, and to an insignificant extent only, the cultivating occupant. It is not absolutely necessary but neither irrelevant nor perhaps uninteresting to observe here that the amount of land revenue derived by government from this district is about eleven lacs of rupees, and that of this amount nearly two-thirds are paid by three Zumeendars; the rest is divided of course among a number of smaller proprietors.

This sum constitutes probably nine-sixteenths of what they derive from their tenants, and about seven-sixteenths of what is actually paid by the labouring husbandman. This calculation does not pretend to be the result of accurately ascertained payments, but is founded on some facts which give it an appearance of approximation, and since it does not give an average of more than four annas per biga on the computed contents of the district available to arable and pasturage, it is at least likely to err below rather than above reality.

Exclusive of the lands cultivated by those who hold through some sort of proprietary tenure, the cultivating occupants rent their possessions on one of two kinds of tenures. These are expressed in the pages which form the first documents in the Appendix, and are a *Jota Jereeb Potta*, or lease of an undefined quantity of ground, for the use of which the tenant pays according to fixed rates determined by the species of crop; and an *Ekeanna Potta*, or lease of a certain quantity of land (ascertained or computed), at an average rent. It is intended in either case that the ryot shall continue in possession as long as he pays rent, for although the agreement is in one case annual and in the other for a certain number of years, yet a lease is established by usage, and confirmed by law, so that tenures become hereditary and attain a duration equal to what may be found in any country. It must at the same time be admitted that the occupations of tenants are so small, their difficulties so many, their tenures derived in a majority of cases from secondary sources,

that they are subjected to many exactions and irregularities, the whole of which do not however amount to any serious drawback on the profits of the pursuit.

I propose reserving for a subsequent paper some remarks on the agricultural processes as they are now pursued, with the method in use for rearing and preparing for sale and consumption some of the principle products, viz. rice, wheat, and some other grain, ginger, turmeric, tobacco, castor oil, &c. With this paper I beg to offer, No. 1. Two Pottas with translations, and a Glossary of terms used in leases and other transactions, between landlords and tenants. No. 2. A list of the agricultural products of the district in a tabular form, exhibiting the periods of sowing and reaping, the quantity of seed used, and the ordinary returns, with a Glossary of the terms used in husbandry. No. 3. A twelve-month's agricultural journal from May, 1823, to the same month in 1824; with a Glossary of the terms used in it.

1.—*Translation of a Ryot's Ekdara Potta in Poornea.*

ONE GOD;

The signature of Meetun Lall, Renter for 5 years. I have agreed to grant this Lease, paying the rate of Rent herein mentioned.

This present Lease is given according with its counterpart given in by Sheik Nejamdee Hussein, cultivating in the village of Munjra Rughoonundun, in the zilla of Gundwara of the Purgunna of Dhurmapoor. The Sirkar of Moongheer in the Province (Sooba) of Bahar.

Henceforth, from the year 1231 until the year 1235 upon paying rent for five years for the land for your own Kamut with the Kamut of Sheik Hadzalli your-own brother. For the lands of both of these Kamuts I have taken your agreement and grant you this Lease. The rate for each biga to be one rupee throughout, both for the village lands and those of the Imlak attached; for cultivated as well as grazing lands, Thing to measurement. Whatever lands both Kamuts  
 be d, or

may contain, the rent, which it may amount to, calculated according to the aforesaid rate; the total, added to the customary charges of *Sikoon* at sixteen gundas (16 gs.) on each rupee, and *Piya* at half an anna (10 gs.) on each rupee, with *Jureeb-Khurch* at half an anna (10 gs.) on each *biga*. This total of rent according with your *Jummabundee* for each and every year, paying by the regulated instalments, shall be delivered in, to me. Should there be default in paying these instalments, for such arrears due, interest on the same shall be charged; and the expenses incurred by my sending servants to demand the dues shall be taken from you, and you will make the same good at your own expense. The lands from this date, whether waste, or destroyed by floods, unprofitable, or being cut away by the encroachment of the rivers, or any other casualties, lie at the ryot's peril. Should any plea, or objection be made to avoid payment of the whole amount of rent according to measurement, it cannot be listened to. The rent shall be delivered in without making any objections or altercation. The measure to be by the *katha* of six cubits, and agreeing with what is mentioned in the following margin.

The *Kamut* lands of your own, and of *Sheik Hadialli*. Village land, as well as the *Imlak*. The lands to be measured in the year 1231, whatever the same may amount to, cultivated, as well as grazing lands.

*Rated at each biga, one Rupee.*

1 Rupee.

*Charges incident.*

*Sikoon*, on each rupee, 16 gundas. *Piya*, on each rupee, 10 gundas. Measuring charges, each *biga*, 10 gundas.

By this agreement, this Lease is granted for five years. Cultivate the lands without fear or distrust, make the most of them, and pay up the rent due on the same. Dated 12th of *Jith* in the year 1231 of the *Fuslee* year.

*Translation of a Ryot's Jota Jereebie Potta in Poornea.*

## ONE LIVING GOD.

*Lala Mungnee Chund, being Farmholder.*

This tenure is given, agreeing with its counterpart given in by Karoo Lal, cultivating and resident in the village of Manjha Chatur, in the Zilla of Gundwara of the Purgunna of Dhurmapoor by A.

Henceforward, for the year 1232 you are to plough the lands appertaining to the aforesaid village on the terms of a kast tenure ; the agreement being, that you shall pay rates only for the lands you cultivate or hold ; the calculated rent for the same with the incumbent charges thereon. Without fear or distrust you are to cultivate and make the most of the land you occupy, and according to this Lease you are to deliver in, to me, the rents which you may have to pay for the same, by each regulated instalment. Should you fail in paying up any of these stated instalments, interest on the same, and the charges incurred in sending my servants to demand the arrears due, it will be taken from you by deduction, and which you will allow of.

The measure of the land to be made by the rod of six cubits. The rates to be levied for the same, are according to what are stated in the annexed margin.

Crops retaining the soil for the whole year per biga 1 rupee.

Garden crops sown, per biga, 1 rupee 8 annas.

Low land rice crops sown, per biga, 14 annas.

High land rice crops sown, broad cast, per biga, 12 annas.

Transplanted rice crops, per biga, 10 annas.

A single crop of other grain sown in the year, per biga, 11 annas.

Four month crops sown alone, in the year, per biga, 8 annas.

Wild crops when sown singly, per biga 4 annas.

Grazing lands, per biga, 3 annas.

Thatching grass lands, per biga, 1 rupee.

By this agreement this Lease of paying only for what you cultivate or the lands you retain, is granted, this 15th of the month of Asseen in the year 1231 of the Fislee year.

## POORNEA.

### *A Vocabulary or Glossary of some Hindusthanee Terms used in Land Tenures.*

Admurjaie, अदमरजाई, a term used in Leases, signifying failures from drought.

Amdunec, अमदनी, the Revenue.

Amlee, अमली, in depute, (Amila or Deputy,) Amul, अमल, under the controul.

Ajun, अजन, the length of a field.

Ashamee, अशमी, an individual. The names of the ryots in the Hustbood so termed.

Ashul-juma, अशुलजमा, the clear amount of rents for lands measured, calculated from the rates. not having the aboab attached to it.

Ashmanee-furmanee, अशमानी फरमानी, a term used in Leases to express any extraordinary demand made by the ruler of the country on the Zumeendar ; the ryots bind themselves to make the same good to him.

Asbab, अशबाब, property, goods and chattels.

Abadee, अबादी, to cultivate ; in cultivation.

Aboab, अबब, the charges of Sikoon and Piya, and sometimes Teanee and Jureeb khurch.

Ekoon, एकून, the total sum.

Ekoon-jumeen, एकून जमीन, a column of the Hustbood showing the grand total of land measured to each ryot for the current year.

Ekoon-juma, एकूनजमा, a column of the Hustbood showing the total of rent on the same.

Ekdurra, एकदर्रा, a common rate per biga.

**Ekdurraka-potta**, एकदुराका पठा, a Lease which allows the same rate per biga for whatever lands the ryot may plough; he is allowed to sow whatever crop he pleases on them without paying any increase of rent for the same.

**Ekfusla**, एकफसला, a single crop; a rate in ryots' Leases, which he is to pay for raising a single crop in the year of certain species of grains; this term applies more to the higher country where the lands being of a secondary quality, one crop is as much as can be derived from them. The crops which rank under this head when sown singly and the land not resown with any other crop during the same year are cotton, janeera, koortee, murrooa, rhur, in some cases indigo, budhee rice. kheree, konee, mutkaye, sun, and paut. When another crop is sown along with, or after these lands have been cleared of one crop, it classes as lallee. The average rate of Ekfusla is about 11 annas per biga.

**Arajee**, अराजी, of your free will.

**Etna**, एतना, as many, to the amount of.

**Alave**, अलावे, ahlaheda, अलाहेदा, over and above.

**Ajnugdee**, अजनुगदी, having taken upon paying a fixed amount.

**Ewuĳ**, एवज, in lieu of.

**Ughunee-fuseel**, अघनुफसील, the crops of Hiontee, mochra and ropur Rice which ripen in Ughun are so named.

**Bisum**, बीसम, in the name of.

**Berajeeka-potta**, बेराजीकापठा, a lease of certain rates to be paid by the ryot for ploughing the soil, levied according to the crops he raises upon yearly measurement; the spirit of the lease is, that he is never to pay *less* than the *preceding* year's jumma, and that he has to pay extra for any fresh lands he may employ over last year's amount, according to his rates, (this surplus land is termed Jureeb besee,) should any minus, termed kumkast, fall *short* of the last year's jumma for the *same extent* of land held in that year, the same must be affixed to make it equal; the excess (Beera besee) is of course taken. Thus,

no loss can arise to the landholder if, he act up to the tenor of the agreement.

**Beera**, बेरा, rates of rent to be paid for the cultivation of the soil; these differ in amount according to the nature of the country and soil, as it may be more or less fertile. The rates are *turkaree*, *salee*, called by some *dofusla*, *Hiontee*, *ekfusla*, *ropur*, *kheel*, *mochnra*, *choumas*, *sungla*, *churi-rumna*, *khrool* and sometimes *putit*. For the several average of rent, as paid in the *Dhurmapoor* *pargunnas* of *Poornea* which comprises the most fertile part of the district, see under each head.

**Beera-beshee**, बेराबेशी, an increase of rent obtained over last year's amount occasioned by crops of higher rates having been sown on the same lands.

**Beeta**, बीता, the lands of a village which have been cultivated from time immemorial, and which from length of culture pay full rates; the term is more applicable to villages situated near rivers whose lands are partly *Deera*, and to which the term is particularly applied.

**Bejot**, बेजोत, a ryot is thus called who throws up all his lands and does not cultivate in the village.

**Bejot-zumeen**, बेजोत जमीन, a column in the *hustbood* showing what amounts of land have been relinquished by ryots without any reserve.

**Bejoot-jumma**, बेजोत जमा, a column in the *hustbood* which shows the sums which were levied on *bejot* lands.

**Beshee-zumeen**, बेशी जमीन, **Be-hee-jumma**, बेशी जमा, two columns of the *hustbood* to show what lands may have been obtained by increase in remeasurement, or surplus amount upon last year's *jummas* from the same cause, or from *beera-beshee*, taken from the ryots.

**Barud**, बारुद, a term applied to the acknowledged subdivisions into which the lands of *mojees* are divided, for the easier distinction, where each parcel of the ryot's lands are situated; the *baruds* are named from some existent or local circumstances as *Poorwaree barud*, the eastern division, *Muttearee barud*, the clay soil division.



**Barud sulamee**, बारुद सुलामी, a consideration taken by the owner of a mojee from the Rakhwala of a barud, for granting him permission to work; this is from 1 to 2 rupees each.

**Bajnama**, बाजनामा, the deed of surrender *in full* for lands which a ryot gives up to the mostajir acknowledging what he has done.

**Babutwaree**, बाबतवारी, lands which have fallen into the renter's hands are so called when taken up by another ryot to cultivate. The ryot cannot hold these lands according to his own rates, he must pay what the renter of the village pleases, or not less than the rate they were held at by the last cultivator of them.

**Babutwaree-zumeen**, बाबतवारी जमीन, Babutwaree jumna, बाबतवारी जमा, two columns of the hustbood to show what quantity of such lands have been retaken and the sums realized.

**Babut** बाबत, from the account of, or, received by the secession of.

**Benap**, बेनाप, unmeasured.

**Benapka potta**, बेनापका पट्टा, a lease agreed upon between the renter and ryot to avoid the bickerings ever incident to yearly measurement and adjustment of rates. After the lands have been once measured and estimated according to the rates the ryots hold, the holder of the village takes the amount as the average for the remaining years to come, which his lease has to run; a potta is made out that he is not to plough more than the same quantity of land then measured, though he may sow any crops or give the lands to whom he pleases to cultivate, as long as he pays his rent, no further measurement takes place on *the old* lands, but any others which he may take up he must pay for accordingly.

**Bajee-jumna**, बाजीजमा, sundry accounts; a head in the hustbood under which are classed such assessments as are not obtained from the direct cultivation of the soil.

**Battouree**, बट्टीरी, an assessment exacted from artificers and

shopkeepers for permission to transact their business in the village. Bettouree and Dheecouree are classed under the same terms in the hustbood.

**Biga**, बिघा, the measure of land upon which the rents are levied. It varies in extent in different *pargunnas*; the most common are of 2025 square yards, 3600 square yards, and 3925 square yards; 20 *kuthas* make one *biga*.

**Bakee**, बाकी, balance of an account.

**Begaut**, बागान, a grove of trees.

**Batwara**, बाटवारा, the act of dividing a crop, to divide.

**Beabooab**, बेआबुआब, not bearing charges.

**Bemojee**, बेमाजी, of the village.

**Bedukhul**, बेदखल, to throw out of possession.

**Bakee-zumeen**, बाकी जमीन, **Bakee jumna**, बाकीजना, two columns of the hustbood to show what remains of the past year's totals, after the *kumee* has been deducted.

**Balooboord**, बालुबुर्द, arable lands destroyed by sand covering them.

**Bekhod**, बेखोद, of your own means (that you shall not cultivate by *koleeati*, कोलिआयती, &c.)

**Bafurjund**, बाफाजुंद, for yourself and he's; (in *Estemraree pottas*.)

**Boutee-jumeen**, बैती जमीन, lands held by the owner of a village to give out to *ryots* who cultivate them and divide the crop; the amount of the produce is placed to account on the village hustbood.

**Burbust**, बरबस्त, incident to.

**Butii**, बतैद, to cultivate the soil upon dividing the produce instead of paying rent; this mode is very burthensome to the cultivator.

**Butiidar**, बतैददार, the *ryot* who takes land of another to cultivate *Butii*.

**Busti**, बस्ति, a village, an assemblage of houses; see *mojee*.

**Bukia-bakee**, बुकीआबाकी, the balance of account brought forward.

**Budkhurch**, बुदखरुच, a term applied by the *ryots* to those nefarious charges which are taken from them, beyond

their lawful rents; some are countenanced by custom, others are allowed to be taken voluntarily; they are generally levied upon the whole body by the subscription of the head ryots. Those sanctioned from length of time and often inserted in the leases are *Jareebkhurch*, *Tulwana* and *Fikana*; the more burthensome are called *salamee*, *teeanee*, *chunda mungnee*, *darwarkhurch surwanee*, and other pleas to extort money, to pay the renter. When a charge of this kind has been once conceded by the ryot, the levying it is thereafter looked upon as a matter of right, till the ryots contest it by going to law.

*Bootard*, बुतरद, a name given to the sundry items levied upon the ryot over his jumma.

*Bukuboolent*, बुकुबुलीचन्त, according with the *kuboolcent*.

*Bumoojub*, बुमोजीब, according to.

*Bukuta*, बुकटा, according to the measure of the *kutha*.

*Bujumma*, बुजुमरा, to the total of, to the amount of.

*Busuruh*, बुसरुह, by the rate of.

*Burwukt*, बरबकत, within the usual period.

*Bursatee-fusul*, बरसातीफसल, those crops which are sown during the regular rains so termed by the ryots, it includes the crops of *mukkaye*, *murrooa*, *rhur*, *bitmas*, *koorthe*, *janecra*, *methee* and *bora*.

*Bhadhoee-fusul*, भादुहफसल, the crops of *jelee* and *Bhadhoee* rice ripening about *Bhadoor* are so named by the ryots.

*Bunjur*, बुनजर, thickets, land in underwood; wild waste lands.

*Chulawun-amdanee*, चलावनअमदानो, the paper of despatch which the putwaree of a village sends with the collected rents to the owner of the village, testifying the sum sent and for what year it has been collected.

*Chura-rumna*, चरीरुमना, lands appropriated for grazing cattle and whose rates average about 3 annas per biga. N. B. Lands in *Jot-jummas* which have been one year putit, become *chura* after that period, if not reploughed.

Chithee-talub, चिठीतलुब, the summons for a ryot to appear before his landlord given to the peada mooseel, citing the defaulter to come and pay up his arrears; see Tuluana.

Chak, चक, the termination of the name of some villages situated on melk land.

Chukla, चुक्ला, the lands of a melk so called.

Chakbund, चकबन्ध, the paper given with the sunud of a melk defining the boundaries, extent, and description of it so granted.

Choukeedar, चौकीदार, the watchman of a village.

Choukeedaree, चौकीदारी, the wages of the choukeedar raised from among the ryots, distinct and separate from the jumma of the village, by an assessment made on each family resident on the mojee, by the thanadar.

Choumas, चौमास, a rate in ryot's leases to be taken for those lands which he sows after the rains, not having had a preceding crop grown on them; mustard seed, carrots, safflower, linseed, mussoor, gram, goorsun, cheena, barley, and wheat, come under this head. If these be sown in succession to another crop in the *same year*, the lands become dofusla, and are charged as salee. The choumas rate is about 9 annas per biga.

Chunda, चन्दा, a sum of money raised by a mostajir from the ryots, for the purpose of charity, or for religious mendicants; it has no connection with the jumma.

Choutkee-kialee, चेठकीकेखाली, an annual sum paid to the mostajir by the person who wishes to act as village weighman, for permission to weigh off all the produce when required by the ryots, either for sale or to ascertain the quantity, no ryot weighing his own grain. The amount varies according to the size of the mojee or the more valuable kinds which it may be usual to raise from the lands. The weighman takes about half a ser in each maund of what he weighs off; this falls on the consumer when it is weighed off for sale, it being taken out of the quantity he purchases of the ryot.

**Kumsaree**, कुमसरी, the workshop of the village carpenter and blacksmith.

**Kuthait**, कुठरन, the man who performs the operation of measuring the lands of a village.

**Kuthāi**, कुठा, the 20th part of a biga containing 20 sers; expressive also of the measuring rod, called ser.

**Khooh-rajee**, खोहराजी, with pleasure and willingly, expressed in agreements that no coercive measures have been adopted to make the party sign.

**Dakhil**, दाखील, a delivering in.

**Dadi**, दादी, a term used in leases: meaning that the owner has given or does give.

**Deegur-rukum**, दोगररकम, any kind of crop, (used in leases.)

**Deegh**, दीघ, a pace, two cubits.

**Deera**, दीरा, fresh lands thrown up by the shifting of the courses of rivers, are so called in distinction from beeta lands. They pay small rates, being liable to great vicissitudes from the force of the rivers.

**Deedar**, दादार, the person stationed by the owner of a village over the ripened crops, to see that the ryots cut them and bring all to the general khamar, and do not purloin any; he remains in charge till the ryots pay up their rents, or the owner satisfies himself by selling off what grain has been produced for the year.

**Deedarka-khurch**, दीदारका खरच, the expenses incurred by employing Deedars placed over the crops paid by the owners.

**Dhee**, धी, the site of a village either occupied or abandoned.

**Dheeooree**, धीचौरी, rent levied for the land which the houses of the people occupy, who do not hold lands in the village to cultivate, to the annual amount of 2 or 3 rupees. The persons pay from 6 annas to 2 rupees according to circumstances.

**Dhotur**, धोतर, a kind of cultivation carried on by ryots coming from a distant village and sojourning for the purpose of cultivating the lands, merely bringing their ploughs and bullocks and erecting a temporary residence.

**Dofusla, दोफुसला**, two crops of any kind raised in the same year. The rate to pay for this privilege is expressed by the term **Salée**, with which it is synonymous so far, that the lands are kept for the whole year (**Sal**) and on that account they pay the same rate. In a more definitive sense amongst the ryots it is applied to those crops where one is taken off the land before the other is set down in the same year; as is usual on the high country, as **indigo** and transplanted rice, **badhooee** rice and the same; or any crop followed by mustard seed, or wheat. Three or more crops are often sown together and raised from the same land, but the rate does not increase above **Salée** on that account.

**Dukhla, दुखला**, an appendage to a **muhāl** or **moji**.

**Dukhl, दुखल**, to take or get possession.

**Dehbundee, देहबन्दी**, the rate at which a ryot holds his lands.

**Durmostajir, दरमोस्ताजिर**, a person who holds any part of a farm from another **mostajir**, for the like purpose to farm.

**Durmian, दरमिआन**, in the midst, to bring against.

**Durhuddayi, दरहुददार**, the whole, or to the whole extent of.

**Durkhast, दरखास्त**, a petition or tender.

**Durwarkhurch, दरवारखर्च**, an amount levied by the renter from the ryots of a village to defray any law charges he may have incurred on the general account where the ryots' interests were concerned. This like all other **budkhurch** is made the plea of extortion every year, whether the expense is incurred or not.

**Dustavej, दस्तावेज**, a certificate of any kind.

**Ijara, इजारा**, the letting lands out to farm, a parcel of lands within defined limits at a fixed yearly total rent for the purpose of collecting the revenue.

**Ijardar, इजारदार**, the person who holds a farm or **ijara** from the **zameedar**.

**Ijardaree-potta, इजारदारीपटा**, a lease for a farm, giving authority to the holder to take possession of all the lands within the **muhāl**; to collect the rents, and keep all the lands in due cultivation. The rents are to be paid in

Sicca Rupees and therefore are not burthened with Aboab.

*Ijafa-zumeen*, इजाफाजमीन, *Ijafa-jumma*, इजाफाजमा, two columns of the hustbood, showing the total amounts of lands relet, or taken into cultivation by ryots; and the amounts of rent to be returned for the same for the current year. The various heads of account by which the *Ijafa* is obtained; see hustbood.

*Hiontee*, हियोन्ते, a rate in a ryot's potta levied for crops of rice sown on low land in February, March and April, when sown as a *single* crop; when combined with another, or when another follows it in the same year, it will have to pay as Salee. The rate is 14 annas per biga.

*Iputdai*, इपुतदाई, from the date of.

*Irsal*, इरसल, cash deliveries by the putwaree to the owner of the moji.

*Istehar*, इस्तोहार, an advertisement, a notice, a paper placed on a ryot's house, warning him that he may come within 15 days and take his lease for the lands he retains, or if refractory that he will be charged at the highest rate levied in the village or *purguuna*. Also a warning given by the Commissioner of Requests that, according to attachment, the ryot's property will be sold, if he do not pay up the arrears within 5 days.

*Istemrar*, इस्तमरार, lands given to individuals by the *zumeendar* to hold in perpetuity upon paying a settled rate of rent. These *Istemrar* lands are mostly given for charitable purposes upon a quitrent of 2 or 4 annas per biga, since the granting of melks has been made unlawful.

*Istemrarka-potta*, इस्तमरारका पटा a lease given by the *zumeendar* for an *Istemrar*. The land and its yearly amount is placed in the lease as in *mokurree* pottas, and not subject to aboab.

*Istafa*, इस्ताफा, the deed of surrender for lands, the same as *Bajnama*.

*Itt-lanama*, इत्तेलानामा, a paper of notice served on ryots when they fall in arrears, to warn them of the amount

due, and threatening them with an attachment of their property if they do not make arrangements for paying the same within 5 days.

**Imlak**, इम्लाक, a melk which has reverted to the zumeendar for want of an owner.

**Farak**, फारक, a yearly acknowledgement and acquittal from the landholder to the ryot, that he has received from him to the full amount of his rent, according to the agreement existing between them.

**Farkana**, फारकना, a sum given by each ryot to the owner of the village, or the putwaree on giving him his Farak; the amount varies according to circumstances, those who hold their lands on advantageous rates pay more than those who pay higher.

**Fazil**, फाजिल, surplus money taken over what is due.

**Fayda**, फायदा, profit.

**Fuslee**, फसली, the æra used in leases and other transactions in the Dhurmapoor purgunna and other places; otherwise termed Moolkee; it commences the 1st Bhadur, (15th August to the 10th of September.)

**Fusul**, फसल, a crop or harvest. The two general crops of rice, badhooce and ughunee are so termed. The ryots among themselves class the various crops sown at three distinct periods of the year, into the Maghait, the Bursattee, and Rubbee Fusul.

**Ferista**, फेरिस्ता, the file of village papers for each year.

**Giruh**, गैरुह, other persons or things.

**Giruhkhurch**, गैरुहखर्च, expenses of various kinds incurred in collecting the rents of a village for servants and other charges, are so termed.

**Ghat**, घाट, a ford across a river, a ferry, a place of landing on the banks of a river.

**Goojusta**, Goojusta zumeen गुजस्ताजमीन, Goojusta jumma, गुजस्ताजमा, last year's two columns in the hustbood showing what the last year's amounts of land and rent were in the village, preparatory to showing and explain-



- ing what have been the decreases on the same in the present year, and what have been the increases over it.
- Goswara, गौश्वारा, a general abstract.
- Gorizt, गौरिस्त, the servant established in each village under the putwaree, to go round and call the ryots to the kutcheree when required ; he receives 1 rupee per month.
- Gaw, गांव, the provincial appellation for a village or bustee.
- Got-bustee, गोटबस्ती, the chief or first assemblage of houses which were erected on the moji goes by this distinction ; other erections are called tola or putee.
- Gunj, गुन्ज, a mart, a market place in a town.
- Gurkee, गरकी, crops lost by an overflow of water.
- Gurkee-khooskee, गरकीखुशकी, a term in pottas signifying that if the crops be destroyed by the draught.
- Hajuree, हाजरी, resident on the moji.
- Hajuree-sabek, हाजरीसाबेक, a resident who has held lands more than one year.
- Hajuree-nowabad, हाजरीनोबाबाद, a resident who takes up land to cultivate for the first year, is so termed in the hustbood.
- Hal, हाल, the present, or current.
- Hat, हाट, a village market.
- Hatka-chootkee, हाटकाचुटकी, a tax levied by a renter of a village where a market is held on the people who bring commodities for sale, a portion being taken in kind from each parcel brought. An item in the hustbood to show the value of what has been taken in the year. The profits of a hat are generally leased for a specified sum to some individual.
- Hat, हात, a cubit of 18 inches used in land measure. The Doorgadasee hat for timber measure, is of 22 inches.
- Havulhat, हावलहाट, the balance of the village cash account in the putwaree's hands.
- Hudmuhadood, हदमहदद, a term in Ijara pottas signifying, that the holder is to have power over all the land and crops grown on the extent of the muhal.

**Hurbeerah**, हरबीरह, a term used in Ekdurra leases, signifying, bearing the same rate of rent per biga throughout.

**Husthood**, हस्तहुद, the rent-roll of a village signed yearly by the putwaree. The common form is an abstract of each ryot's account according to his Jumma-bundee (asul with aboab included). The heads of the Husthood are, Sabik Hajuree, Noward Hajuree, Kast ryots (if any), Sabik Poye, Nowabad Poye, Istenrar-jumma, Kamut, Bajee-jumma and Betource-jumma, these are the different totals. The columns of exposition to this account, both to land and the jumma, to show what land has been thrown up by some ryots and released by others, for the current year, specifying each particularly, so as to present a full abstract at one view, are, Asamee, Kulm, Zumeen-goojusta; Kumee-zumeen by Bejot, Supoordee, Kharjee, Ojjooree, Jureeb-kumee-zumeen:—Bakee-zumeen; Jjafa zumeen obtained by Kheel, Babutwaree, Kharjee, Zumeen besce-jureeb; which gives Ekoon-zumeen for the current year. The sums to go against these heads of land measurement are, Jumma-goojusta, Kumee-jumma by Bejot, Supoordee, Kharjee, Ojjooree; Jureeb-kumee: Bakee jumma (on the old year) Jjafa-jumma, received by Rustee (for any which may be taken yearly), Kheel, Babutwaree, Kharjee, and Jumma-besce: Ekoonjumma-roopiya, (the total rents for the present year;) for the definition of these heads of accounts see their respective names.

**Hi**, हे, it is in your possession.

**Hujkool**, हजकुल, to the whole extent cultivated.

**Hurhaslee**, हरहासली, lands in crops, or, lands being in crop.

**Jabtee**, जाबती, to be taken without reserve; to seize.

**Jureeb**, जरीब, the measure of lands.

**Jureeb** or **Jureeb-khurch**, जरीबखरच, the expense incurred in measuring, customarily paid by the ryots to the owner of the moji, at the rate of half an anna on each biga measured, called **Jureeb**.

**Jureeb-besee** or **Zumeen-besee**, **जरीबबेसी**, an increase of land in the current year's jumma over the past, which the ryot has to pay for (unless he gives rustee for the same). A column of the hustbood to show this surplus obtained ; see **Beshee-zumeen**.

**Jot-jureebeeka-potta**, **जोतजरीबीका पट्टा**, a lease which authorizes the ryot to pay rent only for what he ploughs, or retains annually, to be measured and rated according to the rates of his potta for each crop he raises from the soil ; should there fall a minus in the total of the present compared with the past year he is not called upon to make it good. The rates in **£** **Jot-jureebepotta** are stated under **Beera**.

**Jureeb-kancee**, **जरीबकमी**, less land measured the present than what was last year in a ryot's jumma, for which the ryot has to pay (or not) according to his terms.

**Julkur**, **जुलकर**, a fishery. All the hollows and ravines on a **moji** which retain a little water throughout the year are let out on lease from the village ; when the rivers rise over the country, a quantity of small fish arrive with the water, which are taken by the person who holds the lease. The larger waters as rivers and lakes are rented direct from the **zumeendar**, it being usual for these to form a separate **muzhal** from his landed account.

**Jeth ryot**, **जेठरैयत**, the principal or head ryots in a village.

**Jeerat**, **जीरात**, cultivation, or in crop.

**Jil**, **जैल**, as expressed in.

**Zumeenjun**, **जमीनजन**, lands to a defined extent.

**Jota**, **जोता**, ploughing.

**Jot-jumma**, **जोतजमा**, the lands and their amount which a ryot holds in a village.

**Jumma**, **जमा**, the sum total of rents, **asul** and **aboab** included, which a ryot has to pay in the year for the lands he holds.

**Junmabundee**, **जमाबन्दी**, the account of each ryot made out in full, of lands measured in various crops and their amount calculated according to the rates at which a

ryot ploughs; with the aboab affixed, and which the ryot must sign every year when he acknowledges it as a true account. The least objectionable part of the Bootaed-khurch, also attached when acknowledged by the ryots, is placed under the jumma as Sood, Jureeb, Furkana, Teeanee. On the back of the Jumma-bundee are written the sums of money received from the ryot on account.

Jumma-khurch, जमाखरच, the yearly cash account of a village.  
Zumeen-goojusta जमीनगुजस्ता, Jumma-goojusta, जमगुजस्ता, two columns of the Hustbood, which see under Goojusta.

Jumma-jureeb-kumee, जमाजरीबकमी the amount of rent which may fall short, on account of *less* land falling in the ryot's jumma than *last year*.

Jumma-beshee; see Beshee-jumma.

Jungla, जंगला, a rate in a lease to include the inferior crops when sown: these are, peas, kesharee, kuluya, renchee, bora, and bitmas. When any of these is *combined* with a standing crop, or sown *after* a crop has been removed within the *same* year; the ryot will be charged the salee rate for the land. The jungla rate is about 4 annas per biga.

Jurkool, जरकुल, the whole extent.

Zumindar, जमीनदार, a landlord.

Zumindaree, जमीनदारी, the territory of the landlord.

Zumindaree ka potta, जमीनदारीका पट्टा, see Khaska potta.

Zila, जिला, a hundred into which the zumindar divides his purgunnas, each having a kutcheree for collection.

Jiwar, जिवार, the head inhabitants in a village.

Jut, जत, as much as; the rates of a lease are so termed concisely.

Kamut, कामत, lands held to cultivate in a village by a non-resident individual, the cultivation being intrusted to a servant or kamtee. A head in the hustbood to show who these lands are rented by, and for what amount.

Karindee, कारिन्दी, cultivating in the, and resident in the.

**Kita j̄arib bundea**, किता जरिब बन्दी, the dimensions of each field, inserted as is sometimes necessary, in pottas, where the land is subject to dispute.

**K̄ist**, क़िस्त, the instalment of rent. These are so many annas in the rupee of the jumma to be paid at certain periods usually regulated by the time of the various crops ripening; and as the harvests are larger or smaller the k̄ists vary accordingly. In different parts of the district they vary according to the nature of the lands.

**K̄ist-kh̄ulaf**, क़िस्तखिलाफ़, default in paying up the k̄ists at their appointed periods. Interest is allowed to be taken for the time elapsing, and landholders can attach for each default as it occurs, if they please.

**Khas**, खास, peculiar, the collection of villages is so called when the rents are collected direct by the *zum̄indars* from the ryots.

**Khaska-potta**, खासका पट्टा, a lease given direct by the *zum̄indar* for the cultivation of the soil to the ryot. It is applied provincially to the *Jotjareebee* potta.

**Khujana**, खजाना, rent for the soil.

**Khurch**, खर्च, expenditure, or charges.

**Kheel-pat̄it**, खीलपतित waste-land. *Sun-pat̄it* lands become *kheel* after remaining another year uncultivated or unoccupied by any one. Any ryot may plough *kheel* lands as common to all, and pay for them according to the tenor of the lease he holds. In some pottas there is a distinct item for the rate where the lands are of a superior quality, paying about 10 annas per *biga* for the whole year; the second year this will rank according to the crops sown, ryots paying *rushtee* can plough up, and in virtue of it, not pay any thing more for the *kheel* lands they employ as long as they pay the *rushtee* annually.

**Kheel-zum̄in**, खीलजमिन, **Kheel-jumma**, खीलजमा, two columns in the *hustbood* to shew what quantity of these lands have been broken up, and what is received by them.

**Kharjee-zum̄in**, खारजिजमिन, **Kharjee-jumma**, खारजिजमा, four columns of the *hustbood* showing what amounts of land

and rent have been struck from one ryot's account and carried to that of another.

**Khanabaree**, खानाबारी, the small patch of ground behind a ryot's hut ; which he plants with greens, plantains, &c. for the use of his family and for which he is by courtesy exempted from paying rent to the owner of the village, though he can enforce the payment of it if he pleases.

**Khatirjuma**, खतिर्जमा, to be assured, to fear no after result.

**Kubooliat**, कुबूलियत, the counterpart of the lease which is given in by the ryot to his landlord.

**Kola**, कोला, an offset in a field.

**Koliit**, कोलियत, one ryot taking lands on lease from another ryot to cultivate, or his cultivating the jota-jumma-zumîn under the cloak of the ryot's light rates ; the ryot from whom the land is taken measures it off in his own name and pays rent, for the same to the landlord as if he were the actual cultivator. This is unfair to the zumindar, and unless the ryot holds a Benappotta it is not allowed, in Jota-jummas all lands given to cultivate by Koliit or Butidar by any ryot are not measured to him but in the names of the actual cultivators, who are charged with such rents as the landholder chooses to affix.

**Koukurar**, कौलकरार, a term in leases meaning, an acknowledgment, or the agreeing to a thing.

**Khuroi**, खरोल, thatching-grass lands. The rate is about one rupee per biga when mentioned as a rate in a potta : otherwise it rates with the salee rate.

**Koork kur**, कुरक कर, to attach a ryot's property for balance of rents due for the current year (it can only be done within the year). This is done by the putwaree making oath as to the debt before the native commissioner of requests and after serving an *Alanama* on the ryot. A *burkundauz* is sent, who along with the putwaree and the pouna of the village attaches all cattle except bullocks ; and grain, except what is reserved for seed ; all other goods and chattels are attachable to the full amount of the arrears and incident expenses of attach-

ment. After 15 days if the debt be not paid an *Istihar* is sent to the ryot's house, and in five days the property is put up to auction and sold off. An attachment is evaded by the ryot's going to the Commissioner within the 15 days after attachment, and protesting against the debt as not due, he gives security to the amount attached for, and binds himself down to enter a suit in the Sutseree court against the owner of the village within another 15 days, otherwise the attachment will still remain good ; see Sutseree.

*Koorika-khuich*, कुरीका खरिच, the expenses incurred in attaching property for stamps, vukeel's pay, peon's meehad, and auction commission to be paid by the defaulter if the cause be brought to issue.

*Khusra*, खसड़ा, the set of papers containing the village measurements of each field, with the crop which has been sown on the same.

*Kurar*, करार, an agreement.

*Kifiut*, कैफियत, an objection.

*Karsajee*, कारसाजी, partnership.

*Kushotee*, कशती, to calculate the accounts of each ryot's jummas from the khwsra and their beera ; the paper on which the same calculation is written.

*Kulum*, कलम, a column opposite to each ryot's name in the hustbood to show by numbers how many ryots' accounts are placed under each head of account.

*Kumkast*, कमकाशन, the minus difference between a ryot's jumma of the current year, and the past, for the same lands, owing to his not having sown the same crops or used them to the same extent as then. In *Jota-jureeb* pottas it is not levied, but in all the other kinds of leases it is allowed to be taken that no fluctuation may occur.

*Kumi-zumin*, कमिजमिन, in the hustbood, a column to show the total of the deficiency of land beyond that of the past year, by relinquishment or otherwise, as shown in the succeeding columns.

**Kumi-jumma**, कुमिजुमा, a column in the *hustbood* to show the total amounts of rents which have fallen short of last year's jumma, accounted for in the succeeding columns of account.

**Kubj**, कुबज, the receipt of the putwaree given to the ryot for each sum as paid in, on account of rents.

**Khumar**, कुमार, a threshing-floor, the place where all the crops of a *moji* are brought together as they are cut, to be cleaned out; and are not to be taken off without permission of the holder of the village, who after satisfying his claim of rents, lets go the residue.

**Layuk**, लायुक, fit for, appropriate to.

**Lugait**, लुगैत, until the period of.

**Lakhiraj**, लाखिराज, a large melk or jagheer, cultivated by resident ryots, so termed as expressive of being independent of the *rumindar* of the country.

**Lur**, लुर, the measuring rod, also called *luga*, *kutha*, to measure the land with; it differs in length in different parts,  $4\frac{1}{2}$  cubits, 6 cubits, and  $6\frac{1}{2}$  cubits, to the lur: 400 of these square lurs is a *biga*; 20 square lurs a *kutha*. In *Dharmapoor* *purgunna* under the estate of the *Tirhoot* raja the 6 cubit *kutha* is used.

**Malgoojaree**, मालगुजारी, rents paid to the landlord for the use of the soil.

**Maf**, माफ, to forgive, or make an allowance for any debt.

**Mafeek**, माफिक, like unto.

**Marfut**, मारफत, through the hands of.

**Malzamin**, मालजामीन, a person who stands security in a pecuniary manner for another.

**Malgoojareeka potta**, मालगुजारीका पट्टा, the same as an *Eejara potta*.

**Mathuree**, मातबुरी, the person who attests on his own responsibility that the person who is offering himself as security for another, is fully competent to pay the debt if called upon: by this act, he pledges himself to make good any deficiency should the *Malzamin* not be able to make all good.



**Meena, मीना**, to subtract, to make a deduction in an account.

**Melk, मेल्क**, a portion of land held by private individuals free of rent, and alienable property being a grant of yore from the holders of the country to persons.

**Melkdar, मेल्कदार**, the person who holds a melk.

**Muhal, मुहाल**, a division of a certain extent of land within regular defined bounds, into which the country has been portioned out for the easier collection of the rents; these muhals when of land have appellations to them and are called *moji*, and the houses on this *moji* taking the same names create the villages. The large fisheries are called *muhals*. This name is given to the *zumindar's* property, in contradistinction to the Melk lands. The heads of a village husbandry are termed *muhals*.

**Mi, मी**, with.

**Mokam, मोकाम**, the place of residence, home, a place.

**Mublug, मुबलुग**, amounting to.

**Mochura, मोचरा**, the crop of late sown rice (of May and June) so called from the hasty manner with which the ground is got ready; a rate in a ryot's potta for these crops when sown *singly*, and no other crop raised on the same land *that year*. It pays about 12 annas per *biga*. When combined, it is termed Salee.

**Mouzi, मौजि**, a village, the common epithet given by the *zumeendar* to his village *muhals*; all the houses erected within the boundaries of its extent constitute the village. The term coincides with a parish.

**Moolkee, मूलकी**, having reference to the country, a particular *æra*. The *zumindars* of the Poornea district (excepting in the *purgunna* of *Dhurma-poor*) date their pottas by this year from the 1st of *Shravana*. The Moolkee year is one month in advance of the *faslee* year.

**Moonsif, मुनसिफ**, the person deputed upon the part of the landlord to preside during the measurement of the lands of a village; he is placed there to convince each ryot as his field is measured off, should he dispute upon the point.

- Mookurra**, मुकुरा, the sum calculated, exact.
- Mookurreeka-potta**, मुकुरीका पहा, a lease given for a defined quantity of land inserted in it, and the exact sum to be paid yearly for the same, unburthened with aboab ; the most simple of all pottas.
- Moostajir**, मुस्ताजिर, a person who holds by lease single, or several villages in farm from the *zumindar*. A farmholder.
- Moostajirka-potta**, मुस्ताजिरका पहा, a lease granted by a *moostajir* to a ryot ; see *Khaska potta*.
- Mujkoor**, मुजकुर, aforesaid.
- Mundul**, मुंडल, the chief ryot or ryots of a village. It is also a common title to the respectable men of any of the *shoodra* classes.
- Munttee**, मुन्ती, balance of rents when small, which the ryot pledges himself verbally to pay in a few days ; upon which the *putwaree* gives him his *farats*.
- Moonafa**, मुनाफा, the profit received upon a *moji*.
- Mungnee**, मुंगनी, a contribution asked for, and levied among the ryots of a village by the reuter with their consent upon some pressing emergency ; generally about 4 annas from each ryot, it never has any connection with the *Jumwabandee*.
- Maghat**, माघात, land broken up in *Magha* for the new year's crops.
- Maghatka-fusul**, माघातका फसल, the division of those crops sown between *Magha* and the rains ; so classed by the ryots, comprising sown rice, indigo, cotton, ginger, turmeric, palma-christi, *urhur*, maise, *kheree*, *konee*, sun and *pata*.
- Nap**, नाप, measure.
- Nooksan**, नुकसान, loss.
- Nuveeshinda**, नवीशिन्दा, a writer placed by the landlord under the *moonsiph* to measure the lands of a village, on his part and to act as a check upon the *putwaree* that he may not play tricks ; he is supposed to write out the whole admeasurement of the fields without having any

reference to the putwaree. These two sets of papers are compared together afterwards. The usual method to prevent after disputes, is to compare each day's work in the evening, and to send an attested copy of the same to the owner, signed by the moonsiph, nuveeshinda and putwaree.

**Nugudee**, नगद, ready money, direct expenditure, upon paying direct rent; see Tika.

**Oojuree-zumin**, उजुरीजमीन, a column of the hushbood to show what land has been struck off of last year's account, as contested and relinquished as an overcharge.

**Oojuree-jumma**, उजुरीजमा, a column of the hushbood to show what amount of last year's rents have been given up to the ryots on account of overcharges.

**Ootpuana**, उत्पन्न, produced, the actual returns of rent for a village, or of crops from the land.

**Par**, पार, coarse rice stubble. Lands sown with rice when measured, so termed on the kusra; where the rates of rent are only confined to par and jungla, which sometimes occurs on extensive deera lands.

**Peada-muhasil**, पेदाभासिल, a peon placed over defaulters to urge them to pay up their arrears and whose daily pay they have to make good during the time he stays over them.

**Peadaka roj**, पेदाका रोज, see Tulwana.

**Peshgee**, पेशगी, money paid in deposit of rent.

**Piya**, पैसा, the allowance made of half an anna on each rupee of each ryot's jumma for the payment of the putwaree's wages.

**Pai ryot**, पारद्वेषत, a non-resident ryot ploughing in the village is so distinguished from the hajree or resident.

**Pai sabek**, पारसाबक, non-residents who have held lands above one year; a head of the hushbood to show what amount is received from such ryots.

**Pai-nowad**, पारनोवाद, non-residents who have taken lands to cultivate the *current* year.

**Poor**, पुर, a town, a village. It is often added to another noun as Guneshapoor.

**Poordura**, पुर्दुरा, the higher average rate of the rent of a village or the zilla.

**Poorjee**, पूरजी, a small scrap of paper on which any trifling acknowledgment may be given by the patwaree.

**Poonya**, पुन्य, holiness, the first day of collection for the new year's rent. In Dhurmapoor it is with the ryots the 15th Bhadra, in the other purgunnas of Poornea the 15th of Shravana, fifteen days' later, the zumindaree poonya commences. The poonya is settled for the period when the first crop of the year ripens.

**Poonyaka-chithee**, पुन्यका चिट्ठी, the mandate sent round to the villages from the zumindar giving them leave to commence the poonya; it is dated the 1st of the month.

**Poonyaka khurch**, पुन्यका खरच, a charge made by the putwaree for sweetmeats, &c. sent round to those ryots who make their poonya.

**Potta**, पट्टा, a lease. These are of various descriptions as *Ijardaree*, *Ryuttan*, *Kast*, *Mostajuree*, *Jot-jureebie*, *Bera-jee*, *Benapka*, *Ekdura*, *Mookururee*, and *Istumraka potta*; all of which see.

**Pueh dustee**, पचदुस्ती, the measure of five cubits taken from the elbow joint to the four fingers and thumb for each cubit's length, for a 5 cubit kutha.

**Pounee**, पौनी, the constables of a village, viz. the Nye, Chumar, Choukeedar and Dobee.

**Petit**, पतित, waste land, or land out of cultivation. A rate in some pottas by which a ryot can retain the lands he does not wish to cultivate, by paying a small quit rent for them, after he has once possessed them. This is injurious to the landlord as he cannot get his waste land into cultivation if he wished, and he is only receiving 2 annas per biga for them. See *Chura-rumna*.

**Purgunna**, पुरगना, a district into which the zumindar divides his territories.

**Purwana**, पुरवाना, a paper of permission from the landlord to the ryot, to take up lands to cultivate for which they may agree; the rent to be settled at a future day.

**Putée, पुती**, a large tola, an assemblage of houses distant from the Gota Bustee.

**Putwaree, पुटवारी**, the accredited clerk of the village, who makes up all the accounts of the moji, receives the rents, grants receipts, sees the lands measured, and is responsible for every thing. He is an established servant and is transferred with the village, retaining his situation as long as he behaves trustily. He is paid by the ryots at an established allowance of half an anna on each rupee (see *Piya*) besides other perquisites, as *Farkana*, &c. It has now become usual to allow them a settled salary of 3 or 4 rupees per month in lieu of these items, and for the mostajir to take the same to himself.

**Rubee, रबी**, a general term for the autumn crop, sown after the breaking up of the rains, such as mustard, gram, peas, wheat, barley, safflower, linseed, *kuluya*, &c. &c.

**Rakhee, राखी**, the division of the lands of a village to each *rakhwala*.

**Rakhat, राखत**, a provincial name for lands appropriated for grazing.

**Rakhwala राखवाला**, the watchman of the standing crops, to guard them against cattle trespassing on them, for which service they are remunerated by taking a small portion of the crops of each field at harvest time. At measuring the village, he has to point out what crops were sown on each field to the putwaree.

**Rastij, रास्तिज**, provender furnished by the villages to troops passing through the country, which disbursement the *zumindar* gives them credit for.

**Ropur, रोपर**, transplanted rice. A rate in a lease for such crops, about 10 annas, when these *alone* occupy the land for the year; when successive to another crop, or when another is afterwards mixed with it, it rates as *Salee*.

**Rumna, रुमना**, a general name for grass lands.

**Rusee, रुसी**, a rope, the square side of a biga, 20 lurs. In some parts of the district the land is measured by a cord instead of the rod.

**Rushtee, रस्ती,** a compensation given by the ryot, in certain cases when benap leases are given, of a quarter of an anna to 2 annas on the rupee of the jumma which may have been settled upon; for which bonus given yearly, over and above the jumma the ryot has permission to break up any kheel-putit land, unowned by any other ryot, which he can find in the moji. A column in the hushood is opened for rustee when such a compromise takes place, to show what has been taken from each ryot.

**Ryot, रैयत,** a tenant, the individual who takes the soil for the purpose of cultivating it.

**Ryuttanka-potta, रैयतानका पट्टा,** a lease granted for the purpose of cultivating the land.

**Salce, साली,** a rate in the ryot's potta, when two or more crops are raised from the soil in the year, except when any of these crops do not come under the turkaree rates. In some villages a single crop of indigo is made salee, this is an exception to the general rule, being by right Ekfusla: Bhadhnoee and Ugune (Ugrahayunee) rice sown at the same time, being cut in September and November constitute Salce Badhnoee, or indigo and ropur the same, and choumas or jungla are salee, hiontee and chenor (choumas), or a jungla crop, classes as salee. Cotton fields are often sown with three or four various crops; this is still no more than the salee rate. Urhur and murooa sown together (two ekfusla rates) is salee. It is the same as dofusla. The exceptions to the general rule of two crops constituting salee, are when two of any of the rubee crops are sown together, as the land is then not occupied for the year but for the usual period of choumas only. The meaning of salee is, that the lands are taken up for the whole year. Salee rate averages about one rupee per biga.

**Saliana, सालिआना,** yearly. **Sal, साल,** a year.

**Saltumamee, सालतमाना,** for the whole year.

**Salis, सालिस,** an umpire. Umpires are very frequently called in to decide or adjust disputes among the ryots

arising from their cattle trespassing on each other's crops.

Takeen, टाकिन, an inhabitant of.

Saninhal, सानिनहल, from henceforth, again.

Sia, सिया, the account which the putwaree keeps of the various sums delivered in by the ryots, on account of rents.

Sikust, सिकस्त, loss from the collections bringing in less than what the renter pays.

Shirwan, शिरवान, a person placed by the owner of a village to conduct its general affairs, to settle with the ryots, and to get all waste lands into cultivation.

Shirwanee, शिरवानी, a nefarious charge made by some renters upon the ryots to pay the expenses of a shirwan. It is customary in those villages where the ryots hold kast-jureebie leases, to pay the Shirwan whom the zumindar sends into the village, when he has to collect the rents himself.

Simana, सिमाना, boundaries, or limits.

Sikkzwou, सिक़्ज़वोन, the difference of value which exists between the sikka and sonat rupees. The rents to the zumindar are paid in sikka rupees, while the receipts from the ryots are in the latter coin; to make good the difference to the renter 5 per cent. when the ryot's *usul-jumma* is affixed, and the ryot pays in any coin he pleases, not under the value of a sonat rupee.

Sooddha, सुद्धा, with, included.

Sujawul, सजावल, persons deputed by the landlord to take possession of a village to collect the rents for himself, when the renter defaults and will not pay up.

Sood, सुद, interest of money.

Suud, सुन्द, the schedule or grant for a melk, by which the same is held; see Chukbund.

Salamee, सलामी, money given by an inferior to a person in office, as an acknowledgment of respect. It is a usual tax on the ryot when he receives his potta, or on his obtaining any favorable settlement with his landlord, or his servants.

Sut, सूत, an hundred, or cent.

Sun, सन, a year. Sun-busun, सनबसुन, annually.

Sooruthal, सुरनहाल, a report made by the head ryots and putwaree of a village to the foudjar on any occurrence or casualty occurring of all they know relative to the same.

Sulahiut, सुलाहिउत, information sent by the putwaree to the foudjar, on any occurrence of a criminal nature or casualty happening in the moji, that he may take cognizance of it.

Sufa, सफा, a column or page of accounts.

Sun-putit, सनपुतित, land which has been one year uncultivated, or unowned by any ryot; such are babutwaree lands, and are in the power of the owner of a village, and whoever cultivates them is liable to be charged with the same rent as what they realized, without reference to his rates. When land has remained two years unowned and uncultivated, the *third year* it becomes sirkaree putit, if the owner do not take care to keep it employed by raising a crop from it.

Sirkar, सरकार, government, a landlord.

Sirkaree, सरकारी, belonging to government, or to the landlord. All lands lying waste which are not included in any ryot's jumma are claimed as such, measured off, and retained on the hustbood as producing rates by realizing a jungla crop. If they are unoccupied, those ryots who have given rushtee, or who hold Jot-jureebie leases can take possession of them from being Sirkaree putit, it is usual in September to scatter kulaya or kesaree over such waste lands, which redeems them, and they are let out hereafter to advantage as opportunities occur.

Sirdar, सरदार, a chief, an individual acknowledged as head of one of those communities into which the various castes form themselves.

Sopurd, सुपर्द, a delivering over, the delivering up any part



of a jumma, when from depressed circumstances the ryot is unable to cultivate the whole.

*Soopoordee*, सुपूरदी, the amount of lands and jummas surrendered. Two columns of the *hastbood* to show how much each ryot may have relinquished. These lands when relet are termed *Babutwaree*.

*Shurka-sar*, शरका शर, a term in leases, or in dividing of lands, signifying that the same shall be equally taken or shared with a due proportion of good and bad soil of which the lands may be composed; to take the whole as it exists.

*Surhud-seemana*, सरहदसिमाना, boundaries, in leases, to take possession of all the land within the acknowledged boundaries.

*Surokar*, सरोकार, having to do with; having an interest in.

*Shurukut*, शरुकत, having a share with.

*Shuruh*, सरह, rate.

*Shushdustee*, शशदस्ती, the measure of the 6 cubit *kutha*, when the cubit is taken from the elbow joint to the four fingers and thumb, and by the middle finger again for the 6th cubit. The length of the *Shushdustee* rod is just 9 feet English.

*Shuhurota*, शहरौता, inclusive.

*Surusuree*, सरसुरी, summary, the court of law to receive and decide in a summary manner disputes between landholders and ryots in default of paying up the rents.

*Talooka*, तालुका, a subdivision of a zilla, when three or more *mojis* are put together in a *muhul* for leasing on farm.

*Talook*, तालुक, a small estate, in the possession, or custody.

*Thika*, ठिका, a provincial term expressive of holding lands to cultivate upon payment of rents, instead of halving the produce; in contradistinction of *Buttee*.

*Tinatee*, तैनाती, the peon placed by the owner to assist the *putwaree* in the collections.

*Teeanee*, टीआने, a charge made to those ryots who cultivate by *jot-juribee*, of a trifle on each rupee the jumma may

amount to, as a bonus to the landlord for allowing them to hold such favorable leases unmolested.

Tereej, तेरीज, a list.

Tokaka potta, टोकाका पट्टा, the provincial epithet given the mookurruree potta.

Tool, तुल, the breadth of a field.

Trebaj, त्रेबाज, an angular field, requiring to be measured in three places to find its mean breadth.

Tuhree-o-phulee, तहरीओफली, in leases taken for mango groves giving possession to the holder for the ground as well as the fruit.

Tulubana, तुलुबाना, the wages paid to the peada muhseel sent to demand the arrears due by any ryot; he remains over the ryot (or mostajir when he defaults to the zamin-dar) until he appears, and arranges for the payment, to the satisfaction of the owner. The defaulter has to pay the peon's wages at 2 annas per diem, for each peon sent; both mostajir and ryot bind themselves in the leases they take, to submit to this charge if they default.

Tola, टोला, a subdivision of a busti, a distinct assemblage of houses from the Gota Busti on the moji.

Turkaree, तरकारी, garden lands, a rate in ryots' leases, the highest existing, which they have to pay upon growing any crop classed under this description; the average rate is about 1 rupee 8 annas per biga; but when a single field of rich land is let on lease, for the sole purpose of raising these crops, the ryot pays from 2 to 4 rupees per biga for the same. The crops classing under this rate are garden vegetables of all kinds, ginger, turmeric, tobacco, and palmi-christi.

Tuhuseel, तहसील, the collecting of the rents.

Tuhuseeldar, तहसीलदार, a person sent to collect the rents, the same as Shirwan.

Tuhveel, तहवील, the purse of collections.

Tuphseel, तफसील, a list of particulars, the marginal reference in pottas, where the particulars of the lands, rates,

or amounts are mentioned in full, and particularized more distinctly, than they could be done in the body of the agreements.

*Turdood*, तरदुद, to make the most of. To be careful of.

*Wusool*, वसूल, cash received from the ryots.

*Wusoolat*, वसूलान्, the list of sums which the ryots have paid during the year, prepared to be set against their accounts.

*Wusool-bakee*, वसूलबाकी, the balance sheet of the ryots' accounts for the year, showing the amounts to receive, what is paid, and the balance due.

### SUPPLEMENT.

*Amulnama*, अमलनामा, an order from the *zumindar* to his servants and ryots to give possession to the renter.

*Amul*, आमल, having possession ; in the possession of.

*Uftada*, अफतादा, uncultivated lands, lands being already in possession of another.

*Rubeeka Fusul*, रबीका फसल, that division of crops sown between the end of the rains, and the whole of *Phalgoona* ; so called from this harvest ripening in April and May, when the sun has gained great vigour, (*Rubi*, being one of the appellations of that luminary.) It comprises mustard seed, *chikna*, *kesharee*, gram, *musoor*, *sufflower*, peas, wheat, barley and *cheena*. The other harvests ripen in the rains or else in the winter months.

## No. II.

*Poornea.*—A Table showing each period of raising the various Grains, &c. sown in this District, with the average produce of each crop from the biga of 3,600 square Yards. Weight 80 Sicca Weight.

## THE MAUGAT FUSUL.

The Crop.	Native Name.	When sown.	Seed per Biga.	When Reaped.	Average Produce.	Part of the District most cultivated in.
Cotton.	Banga,	March & April,	10 seers.	Sept. & Oct.	5 mds. uncleaned,	West & N. West parts.
Ginger,	Adruk,	April & May,	10 maunds,	February,	60 maunds,	West & N. E.
Turmeric,	Huldee,	Ditto ditto,	8 maunds,	January,	70 mds.	Generally; but more so W. N. W. & S.
The Bhadoose	Jalee dhan,	March & April,	25 seers,	August,	8 mds.	Generally in small quantities.
rice Crop.	Bhadoose dhan,	April & May,	30 seers,	September,	7 mds.	Ditto more so N. N. W. & South.
	Heotane dhan or	February,	Ditto,	Dec. & Jan.	20 mds.	S. S. W. and West.
The Ughan rice	Heotee,	Mar. Ap. & May,	Ditto,	Nov. & Dec.	10 mds.	Generally; more so S. S. W. & West.
Crop,	Mochra, &	May & June,	Ditto,	November,	7 mds.	Generally.
	Ropa dhan,	June & July,	10 seers,	Ditto,	8 mds.	Ditto more so W. N. E. & East.
Palmi Christi,	Adree,	April & May,	5 seers,	April & May,	8 mds.	Mostly among ginger, &c.
Urhar,	Urhar,	Ditto ditto,	10 seers,	Nov. & Dec.	7 mds.	Generally; more so W. N. W. & South.
Indigo Plant.	Neel, Phalgonnee,	Feb. & March,	4 seer &	June & July,	15 Bds. of Plant.	S. S. W. W. & S. E.
Do. for Seed,	Asarhee Neel,	May & June,	Ditto,	December,	1½ md. seed,	N. W. & West.
Moog,	Moog.	March,	2 to 4 seers,	June,	2 to 5 mds.	Mostly sown with rice.
	Umra sun,	May,	5 seers,	August,	8 mds. of sunu,	N. E. & East in small quantities in the
Sun or Pat,	Chunduna sun,	Ditto,	Ditto,	Ditto,	4 mds. ditto,	Ditto. [other parts for private uses.
	Patooa sun,	Ditto,	2½ seers,	Ditto,	6 mds. ditto.	Ditto. [See
Tea,	Teel,	April & May,	1 seer,	September,	½ a md.	Mixed in Budhee paddy, ginger, &c.
Khonnee,	Khonnee,	April,	2½ seers,	July,	4 mds.	South & S. W. or mixed with rice.
Kheice,	Kheice,	April & May,	5 seers,	Ditto,	6 mds.	Ditto.
Maize or Indian	Mukace,	Ditto ditto,	10 seers,	Ditto,	8 mds.	Ditto.
Corn,						

## THE BURSATEE FUSUL.

The Crop	Native Name	When sown	Seed per Biga	When cut	Avg Product	Part of the District where most cultivated.
Murooa,	Murooa,	June & July,	5 seers,	September	4 maunds,	West, N W & North. [ton.
Maize,	Makui,	Ditto ditto,	5 ditto,	August & Sept	8 ditto,	Generally on lands free from inundation.
Kelaya,	Kelaya,	August,	5 ditto,	December,	4 ditto,	W N W & North.
Koorthee,	Koorthee,	August & Sept	20 ditto,	Ditto,	5 ditto,	Ditto ditto ditto.
Janera,	Janera,	August,	20 ditto,	Ditto,	10 ditto,	Ditto ditto ditto.
Urhur,	Urhur,	Ditto,	10 ditto,	Dec & Jan	3 ditto,	East and North
Methee,	Methee,	Ditto,	5 ditto,	February,	8 ditto,	Generally.
Bora,	Bora,	Ditto,	5 ditto,	December,	5 ditto,	Ditto on lands free from inundation.
Bitmas,	Bitmas,	June & July,	5 ditto,	November,	6 ditto,	

## THE RUBEE FUSUL.

The Crop	Native Name	When sown	Seed per Biga	When cut	Avg Product	Part of the District where most cultivated.
Carrots,	[seed] Gujra,	Sept & October	4 seers,	Feb & March,	taken up to feed	Generally
Do Roots set for	Gujraaka moo	February,	set 1 foot a	May,	4 mds [cattle	Ditto
Red mustard,	Lotoatoree,	October,	4 seers, [part	March,	4 ditto,	W N W & N.
White ditto	Poorbeetonee,	Ditto,	4 ditto,	Mar & April,	7 ditto,	N E particularly, less generally.
Rape seed,	Rechee	Ditto	2 ditto,	April,	3 ditto,	South & S. W. on very low soils.
Wheat,	Gehoom,	Oct & Nov.	25 ditto	Ditto	5 ditto,	N W & West.
Barley,	Jou,	December	20 ditto,	April & May,	4 ditto,	South & S W
Oats,	Bilatee jou,	November,	8 ditto,	April,	8 ditto,	Limited to Indigo factories.
Hemp,	Gor sunn,	October,	2½ mds.	April & May,	4 mds. of Sunn	N E W & S. W. in small quantities
Ditto seed,	Badam,	Ditto,	24 ditto	May,	15 mds.	Ditto ditto [for fishing nets.
Gram,	Kesharee,	November,	20 seers,	April,	4 ditto,	W & S W. on clayey soils.
Flax,	Chukna,	September,	20 ditto,	April & May,	6 ditto,	W & W W. [more so N. W & N. E.
Millet,	Chenna,	Oct & Nov	10 ditto,	April,	4 ditto,	S & S W [the crop large generally]
Tobacco,	Lumakoo,	February,	20 ditto,	May,	5 ditto,	The stalks being sliced in with leaf makes
Ditto seed	Musoor,	Planted in Oct	18 in a part,	April,	12 ditto,	Being taken from the sprouts of the cut
Musoor Dul,	Matur,	set down in Sept	34 chatak*,	June,	Uncertain,	N. W W S. S W & North [stems.
Wt te Pea*,	Bikerau,	November,	20 seers,	May & April,	5 mds	S & S W
Grey Peas,	Kosumka,	Nov & Dec	20 ditto,	March,	8 ditto,	West S & S W
Safflower,	Ardee,	December,	5 ditto,	Ditto, [Jan	7 ditto,	N W W S & S W
Palm Christi,	[phool, Ditto,	October	10 ditto,	Flowers taken	4 a ditto,	S W & South.
				April & May,	8 ditto,	

## TURKAREE OR EDIBLE VEGETABLES RAISED IN THE DISTRICT.

English name.	Native name.	When sown.	Planted out.	When ripe.	Plants where sown.	The description of Soils.
Brinjals,	Bigun,	September,	October,	March & April,	Generally,	On high spots & well manured.
Chillies,	Murchas,	Ditto,	Ditto,	Ditto,	Ditto,	Ditto ditto.
Cucumbers,	Kheera,	March,		May & June,	Ditto,	On low moist lands.
Do. sown in maize		June,		August & Sept.	N. & S. W.	On high lands.
Onions,	Piyaj,	February,	March. [ & set,	May & June,	Generally,	On high lands well manured.
Garlic,	Lusan,	October,	Roots divided	May,	Ditto,	On ditto ditto.
Greens,	Sag,	April & May,		April & May,	Ditto,	On low lands.
Turace,	Tursee,	April,		May & June,	About town,	High and low.
Ram turace,	Ram turace,	June,		August & Sept.	Ditto,	On high lands.
Sweet Potatoes,	Sakurkund,	April,		November & Dec	Generally,	On high lands and fields.
White Potatoes,	Sootna aloo,	April & May,		Ditto,	W. N. W. & S.	On rich high lands.
Yams,	Phool aloo,	Sept. & Oct.		Ditto,	Ditto,	Ditto.
Potatoes,	Bilatee aloo,	March & April,		February,	Ditto,	Ditto.
Arum,	Kuchog,	April & May,		November & Dec.	Generally & grows wild,	On rich soils.
Kurda,	Kurda,	March & April,		May & June,	W. S. W. & S.	On light rich & low soils.
Palwal,	Palwal,	March,		May,	About town,	On rich high lands.
Watermelon,	Turbooz,	Ditto,		May,	On banks of sandy rivers	On sand.
Musk-melon,	Kakree,	Ditto,		May,	Generally,	On rich low lands.
Radish,	Mooler,	October,		November & Dec.	Generally,	On rich high soils.
Country Bean,	Secm,	May & June,		February,	About town,	Ditto.
Cummin seed,	Jeera,	October,		April,	Mostly sown on the banks	On light low rich soils.
Coriander seed,	Dhuniya,	Ditto,		December,	[of the Kosce & Ganges,	In the sluice of the waters.
Fenugel,	Soca,	Ditto,		Dec. [on in Jan	In small portions in a	green state generally used.
Sugar Cane,	Kutli,	Planted in Oct.		Cut for expressi-	In the N. E. quarter,	On stiff rich soils.

POORNEA.—*A Glossary of some Hindoosthanee Terms used in Native Husbandry.*

Ekhala, एकहाला, moisture existent throughout the depth of mould.

Ukuraya, अकुराया, the land not being sufficiently tilled for receiving the seed, either clods remaining, or grass and weeds not being extirpated.

Adur, अदुर, Udra, a ditch and the mound of earth dug round a field.

Argeer, आरगेर, the strip of sward which encompasses each field.

Atee, अटी a sheaf, a bunch or handful of the cut crop of any kind, being the portion which the reaper receives for cutting a bojha or load of the harvests, usually equal to one-sixteenth.

Udwharee, अद्वहारी a bullock not broken in for work.

Alum, अलुम, sticks set up for clinging crops to rise by.

Awal, अवाल, the enclosed space formed by the cluster of the ryot's houses.

Athunt, अठन्त, a two years bullock.

Arola, आरोला, a short sweet grass growing in small tufts; the seeds when ripe are often used as food by the lower classes when scarcity occurs.

Aneyar, अनेयार, the time allotted for ploughs or labourers to work in the warm weather, being from sunrise till noon; see Duratee.

Bhoom, भूम, soil.

Baloo, बालू, sand.

Ballooa, बालुआ, sandy.

Baloooord, बालूबुद्ध, arable lands which have been covered and spoiled by the sand of rivers being thrown over them.

Buriya-bhoom, बडियाभूम, a rich and fat soil.

Basgeeta, बासगीता, crops being choaked and destroyed by weeds.

**Batwon**, बतवोन, the finishing, ploughing and harrowing given to dress the lands preparatory to receiving the seed.

**Buna**, बुना, land in a state of preparation.

**Buriya**, बरिया, luxuriant, strong.

**Banta**, बान्टा, the tying up the harvest into sheaves or trusses.

**Bojha**, बोजा, a load, a sheave or bundle of grain or grass.

**Ban**, बाण, an overflow from the river.

**Bidar**, बीदर, the rake worked by oxen, used to loosen the soil and extirpate weeds from among the standing crops of young rice.

**Bidur-purota**, बीदरपुरोता, the act of dressing the paddy crops with the rake and chukee; after raking, the chukee is dragged over to resettle the disturbed earth.

**Butan**, बतान, the place of assemblage for cattle at night in the open field.

**Bag**, बाग, to sow.

**Boon**, बून, the quantity of grain given to a labourer for his day's work in weeding the crops; it varies in different villages from  $2\frac{1}{2}$  to 3 seers of rough grain.

**Bhoonja**, भुन्जा, parched grain, with which it is usual for the ryots to refresh their workmen at noon on the field: it is given in addition to the boon.

**Bunkta**, बकटा, the crop on the field having failed, so as to be hopeless.

**Burud**, बरुद, bil, बैल, a bullock or ox.

**Bhish**, भैष, a buffalo.

**Beeshkhia**, बीशखीय, a miscarriage.

**Bhanja**, भान्जा, ryots clubbing their ploughs to work together for mutual convenience: the team of ploughs are so called and each ryot takes the bhanja in his turn according to the complement of bullocks he furnishes.

**Bedowl**, बेडौल, a bad appearance, going wrong.

**Blita**, भीता, the crop, from being stunted, decreasing in size.

**Bumla**, बमला, a spring, a hole formed by water springing up from underneath the soil, caused by the river waters



retiring from the country and the water which the earth had imbibed forcing its way out.

Beejmar, बीजमार, the failure of seed in germinating.

Burun, बरुन, alluvial, fresh earth thrown into hollows by waters.

Beehan, बीजन, seed. Beej, बीज, the provincial term.

Bhoghiya, भोगिया, a small light basket made of twisted grass used by the ryot to carry the seed in which he is sowing.

Birna-khur, बिरनाखुर, a tough rank grass which infests those uncultivated lands which are inundated yearly ; it grows in strong tufts and its roots are particularly binding, nothing but digging will bring such lands into culture ; see Kutra.

Bukana, बकाना, a cow which has lost its milk.

Bukana-leeroo, बकानाखीर, a weaned calf.

Bera, बेरा, a fence of sticks and twigs set up to protect a field.

Bukharee, बुखारी, a round granary, made of grass reeds and mud, raised on piles.

Badar, बादार, a large house granary raised on piles ; see Moonhur.

Bund, बन्ध, a mound raised round land to retain water for transplanting rice, &c.

Beeta, बीटा, a tuft of reeds, rice, or roots of ginger, turmeric, &c.

Beo, बीछो, to multiply by throwing shoots out around the planted stems of rice or any crops.

Beechra, बीचरा, seeds of any kind which may be set down expressly for the purpose of being transplanted into other grounds ; the term is appropriated pre-eminently to rice seedlings.

Ch'hita, चिटा, to sow seed or lands as the river retires on the mud deposited, without ploughing.

Chikna-matee, चिकनामाटी, fat clay.

Chora, चोरा, to cut down grasses or straw with the sickle.

Chas, चास, a ploughing, a single ploughing, used also to express a standing crop.

- Chopachop**, चपचप, the lands being all under water ;
- Chuskee**, चुकी, the piece of wood which answers the purpose of the harrow ; it is 10 feet long, 9 inches broad, and 3 inches deep, having a groove cut underneath its whole length to catch the clods and pulverize them.
- Charan**, चारन, a branch of a river flowing only when the waters increase.
- Churan**, चुरान, lands partaking of the nature of a chur.
- Chuk**, चुक, a regular patch of land, a field of ample dimensions ; also the lands of a melik ; the termination of villages erected on melik lands.
- Chukhan**, चकहान, a quadrangular field.
- Chur**, चर, a piece of low land, an island.
- Ch'hul**, चिहल, to pare the turf off.
- Chhukha**, चका, a four yearling, a young bullock having cut six teeth.
- Chepa**, चेपा hard clods of earth.
- Chouree**, चौरौ, a patch of land shelving to a centre where water remains without means of egress ; see Chour.
- Churwar**, चरवार, a cow-herd.
- Chekree**, चेकरी, a sod of turf and earth.
- Chupchup**, चपचप, slushy, miry.
- Chuhala**, चुहला, mire, mud.
- Chour**, चौर, a morass, either dry or partially dry in February.
- Cherou**, चेरौ, to graze ; Cheree, चेरी, grazing land.
- Choka-baug**, चोकाबाग, seed sown immediately after a fall of rain ; (an advantage never to be missed.),
- Doba-mara**, डोबमारा, low lands which lose their moisture from sand lying too near the surface.
- Dheesaa**, धोसा, lands on the scite of an abandoned village, much valued.
- Donee**, दोनी, treading out the grain from the straw by bullocks.
- Dhenkee**, डेनकी, a pedal for cleaning rice.
- Dunda**, दुदा, a wooden pestle.

Dhal, डल, an influx of water afresh coming down the river from the hills.

Dhi giya, धी गिया, washed away by inundation.

Dhar, धार, a ravine either with or without water.

Dhak, धाक, arable land situated in a ravine.

Doba, डोब, a pond of water.

Doban, डोबान, arable land situated around and in the beds of dried ponds.

Dera, डेरा, a ryot's habitation.

Dhih, धिह, the scite of a village occupied or unoccupied.

Dinatee, दिनानी, the time of ploughs working when they are set to work at 10 A. M. and work to an hour before sunset; also the time of work for labourers employed.

Doodhbutee, दूधबूते, filling with farinaceous matter, applied to the green husks of the advancing corn.

Doul, डौल, appearance.

Dhumka, धमका, checked in growth.

Dhepa, डेपा, a clod of earth.

Duldul, दलदल, quicksand.

Dibee, दिबी, the germ in seeds.

Doobree, दूबरी, a soft sweet creeping grass.

Dhuba, धुबा, the best kind of thatching grass from the breadth and pliability of its leaves. It grows on lands which are moist and not subject to deep inundation.

Dhatkur, धातकर, a pound or pen for cattle, or the rails of it.

Eesh, ईश, the beam or pole of the plough.

Foota, फुटा, having projected the ear stalk.

Phooljhurta, फूलजूरता, impregnation.

Phooljhura, फूलजुरा, the blossoms having fallen.

Phal, फाल, the iron sock or point of the plough.

Furiya, फुरिया, the estimate of what a standing crop of grain may produce.

Furiya-lagau, फुरियालगौ, to cut crops by contract upon the estimate of what the crop is likely to yield.

Fusul, फसल, a crop or harvest of any kind.

Gota, गोता, a provincial term for the mustard seed crops.

Guraba, गुराबा, a light soil which from want of strength

never brings the crops to perfection, the lands being hot.

Gurhal, गुरहाल, land without moisture, having lost moisture.

Gulooa, गुलूवा, moist lands on which from the nature of the soil the crops turn yellow and rot, the humidity being too great to allow the young plants to grow up.

Gula, गुला, rotted.

Gudgura, गुदगुरा, abounding in moisture.

Gotara, गोठारा, the rich lands around the villages.

Gova, गोवा, manure, cow's dung.

Guvrau, गुवराउ, to manure the soil.

Goomka, गुमका, the operation of fermenting the green ears of grain to occasion the seeds to separate freely from the husk; the ears are heaped up as soon as cut and the heap covered with straw, a slight fermentation is allowed to take place, after which they are dried in the sun and beat out.

Grihusthee, गृहस्थी, husbandry.

Gace, गाड़, goroo, गहू, a cow.

Gumree, गुमरी, the plants swelled with the unprotruded ear.

Ghas, घास grass.

Gachh, गाछ, a tree.

Guram, गरम, warm, heated, infested with weeds.

Gera-matee, गेरामाटी, loam of fine clay.

Ghur, घर, a house.

Gowal, गोवाल, a cow-house.

Gula-matee, गुलामाटी, a rich free mould.

Gounjee, गौनजी, fresh shoots of rice which are put forth after the crop has been cut, especially with Bhadooe rice, which will produce an after crop of two or three maunds per biga if suffered to remain.

Guruk, गुरुक, drowned and destroyed.

Gir-murung, गैरमरुन, low river lands, which having a sandy basis, cannot sustain vegetation in the dry months.

Hila, हिला quagmire, generally wrought up by cattle passing and repassing on clayey parts.

**Hal**, हाळ, moisture; **halgara**, हाळगरा, lands retaining moisture.

**Ooklee**, उकली, a wooden mortar for cleaning rice.

**Haree-kar**, हारी कर, to break in a bullock for the plough.

**Huratee**, हुराती, appertaining to the plough.

**Huratur**, हुरातर, the place where the ploughs are working for the day.

**Huroree**, हुरोरी, money lent by the ryot to induce a person to act as ploughman; which bears no interest as long as he serves him.

**Hul-dubkaw**, हुलदुबकाव, to make the plough work deep.

**Hulkurayee**, हुलकरायी, to work the plough to form light ridges.

**Hikree**, हिकरी, cultivated reeds grown on low grounds of a marly nature.

**Hul**, हुल, the plough; **hulwar**, हुलवार, a ploughman.

**Hunja**, हुनजा, a head of cattle.

**Hurkur**, हरकर, a pen for cattle.

**Zumeen**, जमीन, land of any description.

**Jeet-bhoom**, जीतभूम, soils which retain their moisture throughout the year.

**Jins**, जिनिस्, a thing, grain cleaned out.

**Jorava-bhoom**, जेरावाभूम, a good vigorous soil.

**Jeeta-zumeen**, जीताजमीन, the same as jeet.

**Jeonur**, जुनर, a rope band to bind the sheaves or bundles.

**Jalha**, जलहा, inundated.

**Jal khaya**, जलखाया, **jul gīya**, जुलगिया, exsiccated by the sun's rays, parched.

**Jhar**, जार, a tuft of grass or reeds.

**Jungul**, जंगल, **jar-shikree**, जारशिकरी, rank weeds, old grass roots.

**Joraw**, जेराव, to affix the oxen to the plough.

**Jiooiya**, जिवविवा, being mature or having attained good strength.

**Jota**, जोत, to plough; the point of the beam on which the drag rests.

- Jeedar**, जीदार, property; crops in existence.
- Jotee**, जोती, the strap which goes round the neck of the bullock to bind the yoke firm.
- Kowara**, कोवरा, crops with an unhealthy appearance.
- Kola**, कोल, a piece of land closed on two or three sides by water; an offset from a field.
- Koree**, कोरी, a bullock who is obstinate and cannot be made to work.
- Kutmatee**, कुटमाटी, clayey lands which lose their moisture near their surface.
- Khurawa-matee**, खारवासाटी, soils which abound greatly with saline particles, these are generally rich from an excess of dung, but lose their moisture in the dry winds.
- Kata**, कटा, having no strength.
- Kuda**, कड़ा, the lighter particles of mud and vegetable matter brought down with the waters when they spread over the country and enrich or renew an exhausted soil.
- Kheta**, खेत, a field.
- Kurkureeya**, कुरकुरीया, the plants on a field shrivelled.
- Khetee-putaree**, खेतिपतारी, agricultural work.
- Kurea-matee**, कुरियामाटी, black earth, the result of high and long manure falling over the lands from a distant period. Dheesa lands are of this kind.
- Katnee-bundee**, काटनिबन्दी, reaping the harvest.
- Khumar**, खमार, the threshing floor on which all the crops cut are accumulated and cleaned out; a piece of ground is chosen free from damp and central to the fields where the harvest lies; the turf is peeled off by each respective ryot for his own grain, and when all is reaped, they commence cleaning it out.
- Khumarka chhoothee**, खमारकाहुती, the releasing of the khumar from the accumulated grain. This is performed by the putwaree who takes to the amount of rent due by the ryots, and gives up the remainder to be taken to their homes.
- Kotlee**, कोटली, a division made in granaries for keeping various grains; an apartment.

sown for the season, for which a propitious day is always chosen.

**Mootee**, मुठी, a handful, a bunch.

**Mowashee**, मोवाशी, cattle.

**Moos**, मूस, the lands situated along the high banks of rivers.

**Mirun**, मैरन, the leathern straps used in the plough and chukee.

**Mujoor**, मजूर, a labourer.

**Mocha**, मोचा, crops beat, sown or injured by wind or water.

**Min**, मैन, a common short grass springing on all rich lands subject to inundation, exceeding noxious to all crops, being so powerful as to choak them. It forms good feeding for cattle in its immature state, but when run to seed if eaten by cattle, it proves highly soporific; quails are remarkably fond of the seeds.

**Mootha**, मुथा, *Cyperus rotundus*, a short grass very abundant on rich cultivated lands and hard to be extirpated on account of its bulbous roots; it grows on light soils of good strength, and is an indication of the soils being free and fertile; water quickly rots it, but does not destroy the bulbs.

**Moonj**, मूंज, *Saccharum munja*, a tough pliable grass which grows on sandy deera lands in the rains, is cut by the ryots to twist into twine and cords for their houses and other work; if kept free from damp it lasts for a long period.

**Meghat**, मघात, lands broken up in Magh (January).

**Moonhur**, मुनहर, a house granary.

**Mooree**, मुठी, carrot roots with their lower end cut off to plant out for seed.

**Noncha**, नोन्चा, lands abounding with saline matters.

**Nitur**, निटर, poor and exhausted through long culture.

**Nimur**, निमर, having lost its fertility.

**Nakus**, नाकस, sterile poor soil of no utility for culture.

**Oodas**, उदास, indifferent, exhausted of moisture, a sickly look in the crop.

**Oopujabanee**, उपजबानी, agricultural returns.

**Oofa**, उफा, a low part of the banks of a river over which the inundation rushes to the low inland country when the waters rise.

**Oowar**, उवार, the ploughing up of a standing crop.

**Oolgiya**, उलगिया, the young plants having died off a field through drought, &c.

**Oojar**, उजार, the grazing down a standing crop.

**Osha**, ओषा, **Oshee**, ओशी, a two yearling calf, an heifer.

**Ooravamatee**, उडावामाती, a free loose mould.

**Petkata**, पीढकाटा, lands that have a thin layer of mould on a poor substratum. A crop of plants which root deeply cannot be cultivated successfully on them.

**Panka**, पांक, **Punka**, पंक mud.

**Peela**, पीला, yellow.

**Pungacha**, पनगाचा, fields saturated with water and having it lie over their surfaces to a few inches.

**Poola**, पुला, a small bundle of plants or sticks.

**Puniyaree**, पनियारी, inundated.

**Pushnee**, पशनी, the hand spud used in weeding, made of iron plate, 8 inches long and three broad at the cutting part, of a triangular shape, the small end being fixed into a handle of wood.

**Putpur**, पटपड, newly formed lands which from their proximity to the rivers receive annually an accession of alluvial soil.

**Puvee**, पुवी, a dike cut to admit water in or out of any place.

**Pirun**, पैरन, the cords which tie the legs of cattle at night to prevent their straying from the resting place.

**Para**, पाडा, **Paree**, a male buffalo calf, a female buffalo calf.

**Poorā**, पूरा, the grain full formed in the ear.

**Pukka**, पाका, ripe, mature.

**Pera**, पेड, a plant, a shrub.

**Putpuree**, पटपडी, the surface of the land caked or hardened from a heavy fall of rain and the sun drying it afterwards.

**Purhata**, परहाता, the handle or stilt of a plough.

**Palur**, पाळर, the yoke.



Pintee, पैती, the goad.

Pepur, पेपर, a bud.

Puchpuch, पचपच, rotted, rotten mud and vegetable substances, miry.

Putoun, पुतौन, irrigation.

Putie, पुतै, straw or grass laid over the lands to protect the fresh planted roots from the sun's rays.

Rekan, रकान, lands out of the influence of river water.

Rogara, रगारा, crops having a healthy appearance.

Rukun, रुकन, a kind, grain, crop.

Rusawo, रसावो, a giving the soil its tone, this is performed by pulverizing and smoothing the tilled field and suffering it to remain some days that the particles of earth may attract moisture from below, as well as from the atmosphere, before the seed is sown. This operation ought always to be attended to as it is observed to assist the young crop greatly in gaining strength.

Raree, रारो, a rank grass infesting high and poor soils, forming stiff clumps of woody stems; the edges of this grass are sharp and cutting and of no service for any purpose, cattle not touching it when other grasses are present.

Rekha, रेखा, a furrow.

Salun, सालुन, fertile good land.

Surdiya, सरदिआ, turning yellow from too much damp.

Shamee, शमी, the iron ring of a wooden pestle.

Sumar, समार, crop ploughing, a ploughing and crop ploughing is also so denominated.

Sotee, सोतो, a ravine through which the river impels its waters on the low country.

Shota, शे डा, a club of the cow-herds.

Sureha, सुरेहा, a strip of land, a narrow field having length but not breadth in adequate proportion.

Seesha, शीश, an ear of corn.

Sumla, समला, a crop having succeeded in regaining its appearance after a check.

Sootura, सुतरा, the same as Sumla.

Shikree, शिकरी, a water reed.

Seedha, सीधा, land being in good tilth.

Soorkha, सूरका, tall and lank plants running up without their proper portion of leaves.

Soorak, सूरक, a fine healthy appearance.

Sukht, सूक्त, indurated.

Sama, सामा, *Panicum frumentaceum*, a soft grass which springs with the rains and forms good food for cattle; the seed of this grass, called Sama, is eaten by the poorer classes in times of scarcity.

Sava kur, सावा कर, to trim the plough that it may work deep on the mould.

Sora, सोरा, a grass growing on lands situated in the beds of nullas and lands which have alluvial soil thrown over them yearly; it forms excellent food for cattle in the warm months; on moist lands it grows as high as the knee, is a creeping grass and very hard to be extirpated from its long and bulbous roots.

Sooliya, सोलीया, laid down, as rice when borne down by the force of the current of water passing over the lands, or by wind.

Sura, सुरा, rotten, applied to the state of the surface of the lands which have been long immersed in water; the vegetation having rotted presents a clear surface.

Surka, सरका, to smooth the earth over.

Shakha, शिखा, the strong seed stalks projected from the kutra grasses sometimes seven feet high.

Sumel, समेल, the pegs or wooden pins which go through holes in the yoke of oxen to steady it on their necks.

Supoora, सपूरा, a full grown bullock.

Tokra, टोकरा, extirpated weeds.

Tulchooa, तुलचूचा, lands of a free contexture with a layer of clay underneath, which retaining the rain water, soon causes the upper strata to become saturated and spongy when trod upon.

Tala, टाला, quagmire in dead waters from rotten vegetable substances.

**Tekur**, तेकर, a thrice ploughing, given to unbroken lands before harrowing.

**Tumnee**, डमनी, the small hand hoe.

**Tumou**, डमौ, to hoe a crop.

**Tupa**, डपा, an island in rivers.

**Tulput**, लपुत, the destruction of a crop by grazing and treading it into the soil.

**Turuk**, तरुक, speedily, a fair opportunity, the nick of time for the necessary operations.

**Tunga**, डंगा, *Saccharum procerum*, a large pithy reed growing on high lands of good strength.

**Tursoo**, तरसू, water soaking up from underneath the soil.

**Tur**, तर, a bottom, under the surface.

**Tur-oopur**, तरचपर, to give the ground a hasty turn over with the plough to destroy the grass and weeds.

**Toota**, टुटा, well broken up.

**Thunda**, डंडा, cool, free from weeds.

**Tool**, तुल, the plough traversing in good trim.

**Teta**, तेटा, stunted, a plough worn away by use.

**Toolshee**, तुलसी, the fresh crown leaves which the branches of plants advance.

**Turseed**, तरसिह, the under part of the soil being broken and prepared, though the fresh vegetation appearing gives the lands the contrary appearance.

**Thoru-thoru**, थोडथोड, the plants of a crop being scant and straggling.

**Tarakur**, ताराकर, the provincial language for *kurarkur*.

**Turiya**, तरिय, plants running up and producing few shoots from their stems.

**Toma**, तोमा, a young bamboo shoot springing up, or a fresh shoot of any planted root.

**Woshaon**, बोशाबोन, the winnowing of grain.

## No. III.

*A twelve month's Agricultural Journal, kept in the Poornea district, by C. H. Blake, Esq., showing the occupations of each month, with remarks on the weather, &c. &c. 1823-4.*

## MAY.

In the commencement of this month, the ryots planted their *ginger*, *turmeric*, and *palma-christi* seed, and throughout the month have been sowing their higher *Aghunee* rice crops (*Mochra*), and, with the rain which fell on the 5th, finished sowing the *Bhadur* (*Bhadooee*) crop of rice; in some places by advantage of this rain *Bysakhee indigo* was sown, but for want of more rain to assist the young plant afterwards, it has all failed.—Ryots have been weeding their *Phalgoonee indigo*, and low *Aghunee* rice, particularly fine weather for the work, and both have promising appearances. On the high country the ryots are weeding the first sown *Bhadooee* rice which had become rather stunted by the drought of April, but the rain has recovered it; they also weeded their *Cotton* fields which look well; the extent of this culture is very limited in Poornea, it was sown the beginning of April.

The only crop cut in this month is a grain called *Cheena*, which was sown in the commencement of March in the low-est lands, it was a pretty fair crop this year, producing about five maunds the biga.

On the 26th the rains set in, and fell very heavily in the north-eastern parts of the district, so as to destroy a great deal of indigo sown in lands situated in the beds of the nullas.

## JUNE AND JULY.

*From 1st June to 20th July.*—With the rain which fell on the last days of May, the ryots re-sowed and completed the *Bisakhee* crop of *indigo*, (called by some *Asarhee*,) which though somewhat late may succeed well, from the abundance of rain which fell having secured the young plant from

drought; the ryots have finished sowing their *Aghunee* crop of rice by this rain, and have put down seed rice for transplanting out in July. This method in some parts of the district is carried on to a great extent.

The ryots are now preparing their lands in the high country for *Mukka* (*Indian corn*), *Janara*, *Murooa*, to be sown with the next fall of rain.

From the 2nd to the 13th of June, fine sunny weather with occasional light showers of rain. The ryots have taken advantage and weeded the rice (*Mochra* and *Bhadooe*) sown in May. All the crops of rice and indigo bear a very healthy appearance at this date.

Among the low land rice crop, sown early in March, the ryots sow a small bean called *moong*; this is now ripe, and has been gathering during the last ten days. When ripe it is not taken up as other crops are, but as the small pods ripen they are plucked off by women and children. A good field sown along with rice may yield two maunds; soon after the rains set in it rots.

The weather since 13th June, has been particularly favourable to the *high* and *dry* soils. The *paddy* crops thereon have a very healthy appearance. By the constant, and at times, heavy rain that has been falling, the ryots have been enabled to transplant a great deal of *paddy*, and that which was first set, bears now a very promising appearance. The rain has also been of great service to the *Bhadooe* crop of rice, the most forward of which is now beginning to throw out ears; this crop has the appearance of being very productive; it now requires fine weather to forward the formation of the grain, heavy rain would be extremely prejudicial, but occasional light showers, an advantage to this, as well as what may be sown after.

*Ginger* and *Turmeric* have been a little pinched by the land being continually damp. The ryots have succeeded in giving these crops the first weeding, but it has been of little advantage, the rain having settled the earth, as firmly as ever round the roots, which hinders the new sprouts from

the roots shooting, as they would, if the weather had been dry after weeding; as yet however the fields are as full as when planted, but the roots and stems have not a vigorous appearance, some dry weather may yet retrieve the crop in a great measure, there being a long time for it to grow in.

The ryots have completed their *Asharhee indigo* sowings, the progress of the first sown has been much retarded by the constant rain, and a great deal remains to be weeded; no serious damage has yet occurred, but fair weather is necessary to bring it forward; more rain falling will tend to destroy a great deal; in some few spots, it already begins to look yellow.

*Mukkaee*, and the grain called *Muroor*, have been sown during this last month; the latter not in such quantity as usual, owing to the rain.

The ryots are employed in turning up fallow lands for next year, and in preparing the high and dry lands appropriated for sowing a grain called *Janera*, also for a legume called *Koothhee*; they will be sown next month.

The only crop cut this month, has been the *Phalgoonee indigo* plant, which has suffered greatly by the incessant rain, that on the high land being sown in fields mostly of a marly nature, they retain the rain water a long time after a few heavy showers have taken place; the consequence is, that the plant turns yellow, and becomes unproductive.

The ryots residing in the lower country, have been employed chiefly in cutting their *indigo*, and weeding their last sown crop of rice. They have not been so successful in transplanting their rice as their high-land brethren; the fields till late having been occupied with the indigo plant, and afterwards having been too deeply inundated by the river water, to admit of this operation; they are at present very busy with this work, the lands being now cleared from the plant and the water having subsided sufficiently to admit it. It is reckoned early in the season to have these lands transplanted, and if the rivers do not rise again quickly, so as to

drown the newly set plants, they may expect an abundant crop.

The low land rice in some parts has suffered severely from the early inundation having washed it away; a great deal being small, was laid under, and rotted by the water, the inundation having come down at so early a period, to what the ryots calculated upon, they had not taken precautions to meet it by sowing early, a great deal had not been weeded; a much more serious injury would have occurred, had there not been so much rain, it has caused that sown on the highest lands, to grow sufficiently to overtop the flood; the water now subsiding a little will make it shoot up, and almost ensure a good return from these lands.

The low land ryots have had little else to employ them during the last twenty days but cutting indigo, the rivers having risen enough to lay all the country under water. The low land Phalgoonce crop within the influence of the great Koosee river is now all cut.

Little loss from actual inundation has occurred in the lands thus situated, as they have mostly succeeded in cutting, as the water encroached on the fields; a greater damage has been occasioned by the rains, the leaves of the plant turning yellow. Another loss to the planters is, their having been obliged to cut their low and prime lands in an unripe state, to save them from the inundation. The indigo crop has been very unproductive to the ryots, as well as the planter, this season. The cattle from the low country, have been sent to the high lands for subsistence, the ryots only keeping a sufficient number of bullocks for the purpose of preparing the land for transplanting their rice.

The rains this year have been as severe as ever was known in this district; for the last month there have not been twenty hours together without rain, more or less; this has occasioned the rivers and nullas to overflow at an unusually early period. Fair weather is now greatly required by all classes.

## JULY, AUGUST AND SEPTEMBER.

*From the 25th July to the 8th September.* From the 25th July to the 6th August, a great quantity of rain fell, which enabled the ryots to transplant rice on very high lands of such a description as is seldom used for that purpose.

The rain caused a little damage to that part of the Bhadooe crop of rice, which was then shooting forth its ears; but since the 7th, there having been fine weather, a large extent has come to perfection, and upon the whole the ryots have as fine a crop on the ground as could reasonably be expected. Since the 25th August they have been cutting it, a great deal yet remains to reap, but all the grain being fully formed no fear remains of the result.

All the rice transplanted on the high lands, has a most healthy appearance, and seems to promise a most abundant Aghunee crop. The weather still keeping showery, gives it every advantage. It is seldom such a crop of rice is reared on the high lands, as this year shows, besides the higher spots being planted, which are usually occupied by inferior grain; a great deal of land from which the Bhadooe crop has been cut has been immediately turned up, and planted out, so favourable has the rain fallen for this operation.

The *Ginger* and *Turmeric* crops have suffered greatly from the rainy weather, especially the former, which is more liable to be hurt from too much moisture; it is only on high and dry soils where it is likely to succeed, and in many places, if the ryots save the seed which was planted, it will be as much as can be expected. *Turmeric* is not quite so bad, but it is much impoverished and in many places rotted by water lying on the lands.

Since the 25th August many indigo factories have begun manufacturing from plant of the *Asharhee* sowings, which has arrived at maturity. The rains at the commencement of August did much injury to the crop; about one-third of the sowings have failed by the rain water lodging in the fields. This crop had been sown to a greater extent than usual in this district; what was sown on high lands of a sandy na-



ture, has turned-out very fair, and after cutting the plant, a good crop of seed may be expected if the weather proves moderate, for a great deal of plant too small to cut for the vats, has been left for seed, and it is expected many factories will be able to supply themselves for the ensuing season.

The ryots took advantage of the fair weather after the 7th August to sow their crop of *Janera*, which at present bears a favourable appearance.

Since the last week of August the ryots have been busy in ploughing up their lands for mustard seed\*, the crop will be rather limited this year by the quantity of land reserved in other years for that purpose, having been appropriated to transplanted rice. The mustard lands being always of the richest description cannot readily be replaced by others, a great deal of manure and preparation being required for them.

The crop cut this month, besides rice as before stated, is that of maize or Indian corn; in some lands it has turned out tolerably, though through the abundance of rain it is generally very poor.

The rice crops in the low lands, keep a promising appearance. From the latter end of July to the 10th August, the ryots were fully employed in transplanting in the higher spots, and the flood subsiding afterwards enabled the crop to gain vigour; a considerable extent of land planted out, which it was expected would have been lost, by the water lodging too long, has sprung up afresh by the favourable weather which we have had since the water decreased; it is still however in peril from another rise of the river which has just covered the lands again, but if it drops quickly,

\* Mustard seed is of two species, the white called *Poorbee-toree*, and the red called *Lotun-toree*. The former kind averages about 80 maunds of 80 sicca weight from the biga of 3600 square yards; it is sown on the richest lands, and undergoes a regular weeding. The red kind also requires a rich soil, but not so much as the first species does; it requires no weeding, and averages about 5 maunds the biga. Three seers of the white *Rinu* will produce one seer of oil; it takes 3½ seers of the red to make one of oil; the oil is much the same in appearance.

which may be expected from the present fair weather, it will escape.

The low land ryots have been employed since the 1st September, in cutting what of the Bhadooe crop was not destroyed by inundation, which in productiveness equals that on the high lands; after the water of the river subsided, when they had little work to do, they employed themselves in cutting away the weeds which sprang up in some places, among the first planted rice, and in the high sown mochra crop which had gone unweeded.

From the 25th to 31st July, the weather was showery at intervals. From the 1st to 7th August, nearly one continued gale from the eastward with drizzling rain, and at times very heavy. The weather was then fine to the 15th, the 16th, and 17th, afterwards squally again with heavy rain, since that to the 8th September fair weather, with occasional showers.

The waters of the great Koosee river have not been so high this as last season, within four inches, but in the vicinity of its junction with the Ganges, the ryots have suffered greatly by an unusual inundation from that river.

Notwithstanding the abundant crops, rice is now selling at an uncommonly high price, occasioned by the great extent of exportations at present going forward to other districts, the grain is bought up almost as soon as it can be cleared from the straw.

## SEPTEMBER AND OCTOBER.

*From 8th September to the 4th October.* Between the 8th and 15th September, the ryots completed sowing their *Janera* crop, and by the 26th, all their fields prepared for *Koothhee* were sown.

The weather has been favourable for both these crops, which constitute the principal part of what is denominated the *Bursatee Fusul*, or cultivation of the rains.

The first sown *Janera*, is now about two feet high, and is very ripe, a large quantity of land has been sown with it this year from the favourable rains rendering many high soils.

capable of sustaining a crop, which in ordinary seasons could not be expected.

The crop of *Murooa* sown on sandy soils, which had escaped destruction, begins now to look healthy.

The ryots have been busy with their ploughs in preparing their lands for their mustard or rape seed crops, during the fine weather they have had since the equinox, and have got well on with the work. Also, ploughing and manuring the lands intended for wheat. Rain now would tend greatly to throw these sowings back for a time, which will be a great disadvantage, much depending upon getting the plants well up before the cold weather sets in. The most favourable time to commence sowing the mustard seed is, after the 15th October, and wheat about the 25th; the whole should be completed within ten days from commencing.

The ryots are always guided by the chances of rain, and never sow till they are pretty sure no more is likely to fail. If a shower of rain falls just after sowing, however light it may be, it is very sensibly felt by the young crops, and they will never thrive so healthily as those which escape a wetting, the earth being at this period very damp, the smallest quantity causes the particles to bind together on the surface, and the soil to remain cold, and however vigorous the mould may be, the plants become meagre and poor. Should the weather prove favourable afterwards, they may improve, but will never be what might have been expected, from the nature of these lands, all of which have undergone an artificial preparation, and are of the finest description of soils.

To the 15th September, all the Bhadooe crop of rice has been cut, it has been a fine harvest for the ryots.

With the fine weather since the 26th September, the ryots have been busy in their *Ginger* and *Turneric* fields, they had been much retarded in their weeding by the continual showers falling almost every day. These crops are much spoiled, and it is only sandy soils, which appear in any way respectable. Rain now would do them damage; the less the soil ad-

heres, the more favourable for the new shoots, which the roots are now giving out.

The standing rice crop planted on the high lands, is exceedingly fine, and promises to turn out an extraordinarily fine crop.

On grass lands, which have been under water to the depth of a foot or two, (being within the scope of the rivers,) the ryots sprinkle *kulaya*, (a species of pulse much used as food for horses in the cold weather, abounding in mucilage.) Being wetted by the rain about the equinox, and protected by the grass above, it soon germinates, takes root in the soft soil, and grows up with the grass very luxuriantly. The grass at this time on such lands, being rank, cattle refuse it; by sowing the *kulaya*, the grass is secured from other people trespassing on it, when it becomes in a proper condition for food, and the whole is generally kept till the cold weather for the purpose of buffalo grazing. Others cut it green along with the grass for their bullocks, while some keep it till it ripens in December or January, by which they save the crop, and have fine grass lands for their cattle to feed upon, which is much required by them at this period of the year. If the breaking up of the rains be severe, this crop, as well as the whole of the Bursatee cultivation suffers considerably, and when laid under water, (as the *kulaya* lands are so subject to,) they entirely fail.

The Asharhee crop of indigo is now in full flower and pod, and has had an extremely favourable seeding period this season. Where the plant has been capable of holding out through the first bad weather, it appears as if it will turn out very fine.

Factories have left off manufacturing since the 20th September, leaving a great quantity of plant which is too small, and unfit for the vats, to take its chance for seed. This, with the new shoots put forward from what had been cut, is advancing towards perfection very fast, from the fair weather they have experienced during the past month, and pro-

mise to many factories a good supply of seed for next season's sowing.

The low land ryots have been fully employed since the 15th, in cutting the rank weeds and grass, which have sprung up among their planted and sowed rice from the wetness of the season, and have more than commonly infested the fields; a fall of rain would be of great service to the rice crop in low lands, assisting it to take fresh root from the fibres, which are put out from each joint of the stalks, when they arrive at a certain maturity. These fibres, as they come in contact with the earth by the stalk falling with the water, attach themselves to the ground and form fresh roots; too much rain so as to occasion a flood, would be detrimental by forcing up what had already fastened, and a great deal would then dry up, or at least produce small and shrivelled grain.

Reports from the eastern part of the district, which are as favourable, as those on the western side, warrant the conclusion, that it will be a most abundant harvest this year. Old inhabitants of these parts declare, that they never remember seeing such an extent of fine rice or *Janera* crops as at present exist, both for quantity and quality. Nothing can exceed the luxuriance of the transplanted rice of the low lands.

The last rise of the rivers, which subsided with the springs, was impregnated with a large portion of the impalpable earthy matter usually brought down from the hills, and held in suspension, and which, as soon as the water becomes stagnated, is deposited on the surface of the ground, and adds its vigour to the standing crops. Rice on such land, though transplanted a considerable time after that on the high lands, soon rivals and exceeds the very best of it.

Since the full moon, the great Koossee river, as well as all the other rivers, have subsided within their ordinary beds. All new deera lands, formed so frequently by the impetuosity of its current, causing it to shift its channels, and which have had a layer of mud over the former sand, have been

secured by the different claimants by sprinkling *kulaya* over them, which sticking in the soft mud, soon springs up and succeeds admirably from the richness of the soil, should the after floods (which often occur) not cover the land and drown it.

From the 8th to 20th September, showery at intervals, but not heavy; in the intervals fine sunny weather; 22nd to 24th squally, with a good fall of rain; afterwards to this date fair, with a hot sun; at times very sultry. The rains evidently have not yet given over, nor may they be expected finally before the 10th October; this will be considered a good time; the general time of ceasing being about the 20th to the 25th.

### OCTOBER.

*From the 4th to the 31st of October.* About the 10th the ryots began planting out their *Tobacco*, and by the 20th all was finished; these fields since then have been weeded, and where the plants may have failed, replaced by fresh ones: the crop looks fair.

From the same date *Carrots* have been sown, as winter fodder for cattle, of which provender it is usual for the ryots to sow from one to two bigas for each plough they may possess.

Some ryots, in very dry soils, commenced sowing their mustard seed about the 5th, but the sowing on the high lands, generally took place from the 12th and is now completed.

Sowing their wheat crops commenced on the drier kind of lands from the 20th.

The most forward mustard and wheat crops look healthy; if in the course of a week, a shower of rain falls, it will be of great advantage; without it, the crops on these lands, will be stunted for want of the requisite moisture.

The ryots are ploughing in stiff soils, for *Peas*, *Barley* and *Mussogr*, which crops it is customary to sow after the mustard and wheat are done with; being sown on inferior land.

damp soils they are not hurt by the delay, as they retain their moisture a longer time than the former kind of lands.

\* The crop of indigo seed, may be said now to have fairly formed itself; the pods which produce the best seed, having perfected themselves, there is little to be apprehended from blight. The flowers being blighted, fall off without producing pods, or if the pod forms, they are not perfect in seed. This has been the chief occasion of late years, of its unproductiveness in this district. The circumstance of the weather having been dry and fine, since the blossoms commenced, and without fogs, which are extremely detrimental to the last flowers, which open after the equinox, from which the best seed is produced, has been favourable to the seed. It is only the last cut kooteas (which are now in full flower) that are doubtful. At present there is every appearance, that this crop will be abundant, and notwithstanding the great losses at first, the district is likely to yield a greater quantity of seed, than it has done for the last seven years.

The Bursatee cultivation comprizing the *Janera*, *Kootee*, and *Kulaya* crops, are exceedingly healthy and vigorous; the former is nearly at maturity, and will put forth its cornspikes within the next fortnight. The two latter crops are just coming into blossom; a shower of rain just now would be of great service to these crops, without it, notwithstanding the present good promises, those sown on dry soils will suffer for want of moisture.

The ryots have been busy since the commencement of the month, in weeding ginger and turmeric fields. That which has held out throughout the rains, has gained a good deal of strength from the late fair weather, and from having no rain at the equinox. The turmeric especially looks far better than could have been hoped for: a light shower of rain would do no hurt, the soil having become very dry for the period, from the westerly winds, which have prevailed during this month more than ordinary.

Rice of all kinds planted on the high lands is now in ear; in some of the most forward varieties the grain has formed, and in fifteen days will be ripe enough to cut; that trans-

planted on dry, and inferior lands, has been much blighted, and stunted for want of a shower of rain about the 10th to wet the roots, and give it strength to shoot forth its ears; a good deal is in this case, and even if it should rain now will be of little avail, for the spikes will be small and deficient in grain, from the previous exhaustion of the land and the plants in consequence not having obtained vigorous maturity. But upon the whole the standing crop is excellent, and if a shower falls in the course of next week, it will be a great help in forwarding the formation of the grain; by coming sooner it will do a little injury to what has just put forth and is in flower. By the end of next month, the whole crop of transplanted rice, will be fit to cut. The season may be reckoned earlier than usual.

The only crop cut this month was muroor, which was reaped at the commencement, and has turned out fairly.

The low land ryots commenced sowing their mustard seed about the 20th, and are now fully engaged in it.

The wheat sowings on these lands will commence a week hence, as will also the small quantity of oat lands which are sown by individuals in low and damp soils; the lands at present contain too much moisture. The young plants turn yellow, and do not grow with vigour if sown in damp lands.

Low lands from which indigo has been cut, or rice washed away, are now being ploughed up for mustard, peas, and barley; the first mentioned crop will be sown during the next week, and the two last afterwards; the low lands being of a stiff nature seldom fail of producing a fine crop of peas and barley.

The various crops of Aghunee rice have come into ear, excepting the very low lands, which are just sprouting. In the southern parts of the districts, the grain has already formed, and will be cut the ensuing week. Both sown and transplanted rice, which is in ear, promise an exceedingly fine crop; a little rain in a few days would much assist the forming grain, but should none fall, the crop will not sustain injury.



At the commencement of the month, as the water retired from off the rice sown on the low land, the ryots scatter *kesaree*, *peas*, and a pungent species of *mustard* called *rayee*. These grains are scattered among the standing rice while the lands are moist. The seed germinates, and grows up luxuriantly after the rice is cut, forming a second crop on these lands. The stubble of the cut rice affords support to the tendrils of the creepers, and when sown on rich river lands, the crops produce as abundantly as if sown with the plough.

The crops of *kulaya* and other pulse, sown as the Jungla crop in September, among grass and on new deerass, are very fine, having escaped an overflow from the Koosee river after the rains.

Since the 4th we have had no rain, all the rivers have retired to a lower ebb than usual; the weather having been particularly dry, the wind mostly from the westward, with calms and sultry weather.

It has been a fine time for the various agricultural occupations of the ryots, not having been in the least impeded in their operations of ploughing and sowing; and the standing crops, with very few exceptions, have not been injured by the dry weather, but in many cases improved. On the whole it could not have been a more beneficial time for the ryots. A good shower of rain, and fair weather afterwards, is greatly to be desired, and will ensure the various crops a good return.

### NOVEMBER.

*From 1st to the 30th November.* In the early part of this month, the ryots completed the wheat sowings, and have since been employed in sowing peas, gram, mussoor, barley and oats.

By the end of the month, all the lands appropriated for these crops, were sown, and the ryots laid up their ploughs, to give a month's respite to their cattle, as well as to employ their ploughmen in getting in the rice crop, the cutting of which has commenced in all directions, from the 10th on the high lands, and from the 20th on the lower soils.

The various crops of toree, wheat, and forward peas bear a tolerable appearance, but require a shower of rain to forward them, more especially those sown on dry soils, of which a great extent has been this year brought into cultivation, from the peculiar favourableness of the season at ploughing and sowing time.

The crop of indigo seed is now fast ripening, and looks fair, especially from uncut plants. The Kooteas have partly failed from the weather after cutting having been less favourable to bringing on the new shoots, than to the forming of the seed: the new shoots having been stunted in growth gave out very little flower, and the lands being much exhausted in their moisture, the seed has not formed properly in the pods. That plant which remained uncut, the seeds being perfect last month, sustained no harm from the latter drought.

Ryots at the commencement of the month employed in weeding their tobacco, white toree, carrots, and safflower; industrious people at the same time gave a final weeding to their ginger and turmeric fields; both these crops have much recovered by the dry weather, and will not turn out so bad as their appearance once indicated.

The crops of kulaya in its various species, and those of Koothhee and Janera, are now in full flower; in the most forward, the grain has completely formed. All the Bursatee crops look very promising.

#### DECEMBER.

*From the 1st to the 31st December.* Little or nothing has been doing this month in the ploughing or sowing way.

The ryots up to the 12th, have been busy in cutting their rice crop, and afterwards to the end of the month, in cleaning it out from the straw.

The crop upon the whole, has been much less productive than it promised when on the field, both in quality and quantity, those lands on which rice had been transplanted, partaking of an earthy or a clayey nature, produced remarkably well, as they, from their nature, retained their moisture throughout, but the produce from the high dry soils, has

been very poor for want of a sufficiency of rain about the equinox. The low-land rice has likewise suffered, and in many places to a large extent, not producing one-fifth part of what it should have produced, though the fields are loaded with straw. This has been occasioned by the same want of rain to enable the new roots sent forth from the upper joints of the straw to take the ground properly; the weather about, and after this time being dry, this operation so necessary where rice has grown very tall and sinks to the ground as the waters retire, did not take effect, the sustenance imbibed solely by the roots of the plant was not sufficient to feed the large body of stalk and to give it vigour enough to enable it to throw out perfect ears; many of these when put forth did not fill, and in others the grain only partially formed, the rest being blighted.

These prime lands have in consequence not produced one half the ordinary crop, which they do when rain falls about the commencement of October.

These are the causes of the crop having generally fallen short of what might have been reckoned on from the large extent of lands this year brought into cultivation, but with all disadvantages, the quantity realized has been considerably more than an average with the last five years. The Janera crop has been cut at the latter end of the month, and has yielded very fairly; the same too with the *kulaya* and *kootthee* crops which, not having suffered when in flower from the equinoxial gale, have turned out better than ordinary.

The mustard seed, on moist soils especially, has suffered much from the rains that fell in this month; that on dry soils is not so much damaged, but all that was in flower at the time the rain fell, has been injured.

The rain has been particularly favourable for the crops of wheat, peas, gram, dal, barley, and oats, which were not sown on the very dampest of lands; it has afforded a very seasonable relief to the wheat, which has been very largely cultivated on the high country this year, from the favourable time afforded at the sowing period, for rearing the crop and which now cannot fail of producing most abundantly.

The cutting of the crop of indigo seed was commenced about the middle of the month and it appears very fair. Those who did not cut too close upon their sowings, but left plant standing, for the express purpose of seed, will reap a great benefit in having a stock of very fine seed for the ensuing season's sowing. The seeds of the uncut plant are particularly plump, and the pods well filled this year.

The kooteas are very indifferent and unproductive this year, the pods being scant and short of seed, though the seed itself is well formed. The quantity of seed produced this year in the district will equal a full average crop; this may be reckoned as doing well, considering the quantity of the plant, which was cut for the vats, and the unusually bad weather it had to encounter in its infancy, and which destroyed so much of what was sown.

Ginger and turmeric in high lands are nearly ripe, the stalks of the latter beginning to fall.

With the exception of mustard, the whole of the Rubee Fuseel has a very promising appearance, and does not require any more rain to assist it in gaining its maturity; more would now be hurtful by making it run up too much into leaf, and destroying its flowers by over-luxuriance, so as to become unproductive in grain.

The weather has been very very cold during this month, especially about and after the showers. The thermometer from the 19th to the 23rd being as low as 52 degrees, under cover, at 8 A. M. On the 10th hard rain fell, particularly in the eastern parts of the district; again on the 20th and on the 27th another shower to the southward, but to the northward and eastward it was accompanied with heavy hail, which has done considerable damage to the crop of mustard.

The cold weather has been the cause of much devastation among the herds of cattle. The ryots have been great losers in their bullocks throughout every part of the district; this was chiefly occasioned by the duration of the rains and inundation, which deprived them of food, besides their being much weakened by the extraordinary labour they have been put to, in preparing lands for the transplanting of rice, which

has so much weakened them that they could not withstand the cold they had to contend with in this month. Those that have escaped death are very much reduced, and consequently unable to go through much work; so much so, that they have not yet been put to work in preparing the lands for the coming year's cultivation. Many individuals have lost one-half of their bullocks, or even more, and the mortality having been so general, they will find some difficulty in replacing their losses, the value being so greatly enhanced by the scarcity, as to put it out of the power of many to purchase, to the extent necessary for the cultivation of their lands.

### JANUARY AND FEBRUARY, 1824.

*From the 1st of January to the 7th of February.* To the first week of January the ryots were busily employed in cleaning out their rice; from that date those whose bullocks were capable of work began to set their ploughs to work in the fields, and by the end of the month all were going.

The ryots throughout January, and up to this date have been ploughing land for indigo, cotton, and two kinds of rice, and in preparing their lands for millet. The work of ploughing is far from being heavy this year, from the great quantity of rice stubble on the ground which protects them from the dry westerly winds; and also through the showers of rain which fell in December.

This has been of considerable advantage to the ryots, enabling them to get their lands quickly into cultivation; their exertions must otherwise have been much circumscribed from the great losses they have sustained in their cattle during December, and the beginning of January.

The ryots about the 1st of February commenced sowing their crop of cheenee or millet. It is sown in the lowest and dampest soils, especially on those lands from which rice has been washed away.

From the middle of January the ryots have been employed in taking up the crops of red mustard on the high lands, and from the 1st of February on the low; it is now almost

all cleared away, and the white kind on dry lands is just ripening.

The crop will fall very short this year from the repeated rains which have fallen, whilst it was in flower; that on damp soils is remarkably inferior.

Ginger and turmeric was taken up towards the latter end of January, the last has turned out very fairly, but the former very badly, excepting some planted on dry sandy lands which succeeded, these lands however are so few, in comparison with the large extent of others which have failed from the incessant rains of the past year, that the general produce falls very short, and the raw root is at present selling at three-fourths of a maund per rupee on the field as soon as taken up. The palma-christi planted in these fields, has commenced flowering and is very luxuriant.

The wheat crop looks remarkably healthy and full, and is almost all in ear. The crops of peas, gram, and dal, are in full flower, and are full of vigour; rain is not required for these at present. It would do injury to the blossoms, and the crop would fall short. Barley and oats, on low soils look well.

The Rubee Fuseel seldom bears so promising an aspect as it does at present, which will not be frustrated in the end if no rain falls during this month.

The high grazing lands are nearly destitute of vegetation, and on the lower country the rice stubble being all ploughed up, or having young kessaree making its appearance over it, there is little feed for cattle, the ryots have therefore to feed their bullocks; commenced pulling their stock of carrots since the last week of January, when the weather became mild.

On the first of January heavy rain, with hail, fell on the northern parts of the district, but to the south only slight rain. The weather up to the 15th was cold, but since that it has become mild.

The indigo sowings on the high lands will commence after the 20th, should the weather continue as temperate as at present, and with no appearance of rain. If a shower of.

rain falls after that date, it will be of essential benefit to every Agricultural operation, as well as to the standing crops, which being then out of flower will fill out its grain, by the replenished moisture.

The season hitherto has been extremely favourable for all the operations for the ensuing year. The rains of December have been of great benefit; had they not fallen, not half the quantity of land at present turned up, could have been brought into culture.

From the low state of the rivers and waters, which have subsided more than ordinarily through the latter rains having fallen so slightly, the lands which were overflowed are more than usually dry. The indigo planters may expect early sowings this season on these their choice lands, which will enable them to set their factories to work sooner than usual and be the means of giving them a great advantage.

## FEBRUARY AND MARCH.

*From the 7th of February to the 25th of March.* From the 7th to the end of February, the ryots were employed in sowing their cheenee crop on the low lands; a great deal of this grain has been sown this year.

The whole of this month and March has been a particularly busy time with the ryots, and their ploughs have had full employment in preparing their lands for the various crops of rice, indigo, cotton, ginger, turmeric, &c.

In some situations, where a sufficiency of rain had fallen, the indigo planters took advantage of it and commenced sowing their high lands from the 25th of February, but the fall having been partial, the ploughing was carried to a small extent.

From the 5th of March the Phalgaonee indigo sowings took place pretty generally throughout the district and a great deal has been sown; the ryots have begun sowing on their low river lands, which are in a dryer state than usual, and from the sowings thereon being thus early effected, they may be looked to with more confidence.

The weather, until the last week, has been particularly favourable for securing the young plant, the wind being easterly and moist at nights, but since the 15th, the dry westerly winds have set in without intermission, which have much dried up the moisture, and begin to threaten those lands, which had but a little portion in them when sown, if the weather does not quickly change, a great deal of the young plant may be expected to fail.

At the commencement of March the ryots sowed their cotton fields, the plants are now above ground and appear healthy.

Since the middle of March they began to sow their river-side and low-land rice crops, the last combined, generally, with a small kind of pulse called moong.

The high land ryots have been ploughing whenever there was moisture sufficient to allow the operation: they have also been preparing those lands which were lately in crop and which from having been broken up before are always capable of being brought into the required tilth for the Bhādoor crop of rice and indigo. They have also ploughed the lands reserved for planting ginger and turmeric.

About the middle of February, the ryots cut their white mustard seed, and during the whole of the month have been busily employed in cleaning out that crop, as well as that of the red kind, which had been taken up prior to that period; both these crops have turned out very short and may be calculated at scarcely two-thirds of a common produce.

From the first week of February the ryots begun to cut their tobacco plant. The quantity produced may be reckoned pretty fair, from the additional extent of land which was this year planted out, compared with what is done in ordinary years, but the quality is inferior. This has been chiefly caused by the dry time just after planting out, checking its growth and not allowing it to attain the luxuriance requisite. The tobacco lands in the district are of a sandy nature, and require rain just after planting to bring the



young crop forward to a certain state ; after it attains this, the roots can find their own nutriment.

When this is delayed, the crop is thrown back in the season, and does not thrive so vigorously as it would otherwise do ; if the young plants be quickly enlarged to the state requisite to enable them to attain sufficient strength, they then gain an early maturity, and have time allowed to gain substance before the ripening period arrives.

Since the first week of March the ryots on the high lands, commenced reaping their wheat crops, and those on the low lands from the 20th. The crop this year is finer than ordinary ; the rain, which fell at the end of February, proved very beneficial for it, as well as for all the various crops of the *Rubee Fuseel*, causing the grain to form perfectly.

From the 10th the crops of peas, musoor and linseed were taken up, and from the 20th those of barley and oats have been reaping. All these have turned out fairly, especially the two last, which were sown in low moist soils, and not at too late a date. The kessaree crop, where sown, is fast ripening and is full of pod ; it is not in such quantities as usual, the quantity sown being circumscribed, on account of the scarcity of seed at the sowing period, owing to the crop of last year having failed.

The cold weather this season has been of unusual duration, and has caused the sowing of rice and indigo to be late, to what the three last years have been, with the exception of the lowest soils. The cold continued till the middle of March, since when, there has been a change in the atmosphere.

On the 25th of February rain fell over the northern and eastern parts of the district, again on the 1st of March, over the same line, accompanied with hail ; both these showers have fallen very partially ; in some places a sufficiency fell, for the present purposes of the ryots.

Since the 15th, strong, dry, and warm westerly winds have been blowing night and day, though the sky still retains a watery appearance, and a change may shortly be ex-

pected; it is much wanted for the various agricultural operations at present called for; should it be delayed after the end of the month it will put a stop to a great deal of work, as the lands will be in too dry, and hard a state, to allow the ploughs to work with effect, in the rice and indigo fields, and will likewise be detrimental to the young plant of the latter crop, which is at present too tender to sustain much drought.

The crop of cheenee will also fail from the same cause, a great deal already beginning to dry up, where the crop is not sustained, by the low situation of the lands, and the redundancy of moisture of course retained therein.

Hitherto the season has not been so favourable as last year for the operations of the ryots, and the crops are not in such a forward state, nor have they the promising appearance they then had.

#### MARCH AND APRIL.

*From the 25th of March to the end of April.* On account of the extraordinarily dry weather, which we have had during this month, almost every agricultural operation has been suspended, or thrown back. The country is parched in the extreme and it is only the lowest soils, which have been able to withstand so long a period of drought.

It was usual for the ryots, nearly to have completed their Phalgoonee indigo sowings, and their crops of Bhadooe and Aghunee rice, by this date in other years, but this year scarcely a third of what has been engaged for of the former has been sown, and of the Bhadur crop only that sown in the low lands has been attempted, which forms but a very small portion of the usual crop; and of the Aghunee not one half has been sown for want of moisture.

Till the first week of April the ryots were busy in sowing their low land indigo and rice; much of the last that was sown has not appeared above ground for want of the requisite moisture. The Bhadur crop has on the low lands been more successful by reason of the nature of the soil, which

is of that free kind, which can retain moisture better than the coarser kinds of clayey lands, which form the principal part of the lower Aghunee crop.

For the last fifteen days many villages on the upper lands have stopped their ploughs from working, the soil being so dry, that they could work with no effect on them. They have prepared their Bhadur rice lands as well as those appropriated for planting ginger and turmeric, and their indigo land remaining to be sown, all of which are ready to take advantage of the first good shower of rain that comes.

The Bhadooe is greatly thrown back this year, none having yet been sown on the high lands, where the greater part is raised; the same regards the Aghunee on the lower lands, and should the season hereafter, prove a wet one, the last crop will be liable to be drowned by the inundation.

Since the fifteenth, nothing has been doing in the sowing way; if rain does not fall shortly, it will be a source of much alarm to the country at large, as a scarcity may be looked for, by the failure of many of the rice crops, unless the weather be very favourable hereafter, to compensate for the lateness of the sowing.

The ryots since the 15th have been employed in weeding their Phalgoonee indigo plant on the low lands, which looks fair and healthy; scarcely one-half the lands agreed for, have been sown, even on the lower soils, and some factories have scarcely a biga of plant; those who took advantage of the rain, which fell in February to sow on high lands have since suffered greatly and have lost one-half of what was sown. In comparing the present appearances of the crop, with that of last year at the same period a wide difference appears. It may be reckoned that there is about one-half the extent of lands in plant that there was at this time last season. The greater part of these are of the lowest description, and the plant is not in such a forward state. Its appearance, however on the river lands, is as favourable as was ever witnessed.

Those factories which have a large quantity of these lands, are likely to do well, though even these have a good deal remaining unsown, and from the lateness of the season, they become every day more and more precarious, the only ground of hope of this plant being in a fit state to be cut for the vat before the annual inundation arrives, is the probability of late rain.

By the end of March the whole of the crops of wheat, barley and oats were reaped ; the two last crops have turned out fairly, and the former very fine. The keessaree fields were cleared in the first week of April ; this crop was very fine. The ryots this month cut the seeds of the palmichristi to make the castor-oil from ; the seeds are poor, and shrivelled this year, from the long drought.

The crop of cheenee has entirely failed and the seed sown will scarcely be realized, a great part of this crop has turned out so inferior that the owners turned their cattle on it to graze, and ploughed up the lands for other purposes ; since it was sown no rain has fallen ; the spikes thrown out in those fields which are on low and very moist lands are very small and the grain on them very scant and shrivelled. The plants were stunted for want of rain, and forced to ripen before the usual period ; the ryots are beginning to cut it. A great extent of land was sown with this grain this year.

For the last month the weather has been extremely sultry in the day time, and the nights and mornings remarkably cool, the wind chiefly from the westward, very dry and at times very strong. The rivers are unusually low ; so much so that we have seldom seen our jheels so much exposed, even by the latter end of May.

*A Glossary of some Hindoosthanee terms used in the foregoing Journal, with the Nagree character used and explained.*

Bursatee Fuseel, बरसातीफूसील, the crops sown during the rain.

Kulaya, कलाय, a long, thin, and small black bean, very glutinous, used as food for horses.

Koorthee, कूरथी, a small thin flat white bean, ditto.

Janera, जनेरा, a tall species of the millet kind.

Murrooa, मरुआ, a species of the grass tribe, a small red round seed, very rank, used for food by the lower classes.

Uru, उरु, Cytisus cajan.

Teel, तील, sesamum, a small black seed, very oily, used in coarse sweetmeats.

Methee, मेथी, Trigonella fœnum grecum, an acrid astringent seed eaten by a few as dal.

Bitmas, बिटमास, a coarse species of the kulaya tribe.

Mukae, मकाए, maize or Indian corn.

Kessaree, केशारी, Lathyrus sativus, a species of the pea tribe.

Transplanted (rice), रोपा, ropa.

Rubec Fuseel, रबीफूसील, the crops sown after the rain.

Chou-mas, चौमास, four months, the general term of these crops in the zumcendar's books.

White Mustard, पुवीतोरी, poorbee-toree.

Red Mustard, लोटनतोरी, lotun-toree.

Ditto ditto, large species, तोरा, tora, sown generally among carrots or peas.

Ditto ditto, very small, रेचो, reychee.

Wheat, गहुन, guhoom.

Gram, बादाम, badam (boot gram.)

Hemp, गेरसन, a fine kind of hemp used for making fishing nets called ger sun.

Carrots, गुजरा, gujra.

Tobacco, तमाकू, tumakoo.

Bora, बोरा, a round and long kidney-bean.

Peas white, मटर, mutur.

Peas grey, बीटकराव, beetkurav.

Barley, बज, Juva.

Mushoor, मसूर, *Ervum hirsutum*, a flat small yellow bean the best of the common kinds.

Safflower, कुसुम का फूल *koosoom ka hpool*.

Cheekna, चीकना, linseed.

Cheena, चीना, a small species of millet.

Aghunee Fuseel, अघनीफसोल, the rice crops which ripen in November.

Hemunttee, हेमन्ती, low land November rice.

Mochra, मोचरा, high November rice land.

Rice, धान, dhan.

Bhadur Fuseel, भादुरफसोल, the rice crops which ripen in August.

Bhadooe, भादूर, the Bhadur rice which is on high lands.

Jullee, जली, ditto ditto, on low river lands.

Phalgoonee neel, फालगुनी नील, Indigo sown in March and April.

Asharhee neel, आषाढि नील, Indigo sown in May and June for seed.

Ginger, अदरक, aduruk.

Turneric, बलही, buldee.

Palmi Christi, large, बाघीअदरी, baghee adree.

Ditto, small kind, चनाकीअदरी, chunakce adree.

Cotton, बांग, bangha.

Sun Puttooa, सनपटुआ, pat sun, a reddish kind of hemp very strong.

Sun Chunduna, सनचन्दना, pat sun, a white and very tall kind of hemp.

Seed rice for transplanting, धान का बीचरा, dhan ka beechra.

Moog, मूग, the smallest and most esteemed of the pulse kinds.

A crop ready to put forth its ears, घनरी, ghumree.

An ear of corn, शीशा, sheesha.

Khumar, खमार, a threshing floor, the spot of ground cleared for beating out the crops.

Kheel, खील, lands which have been three years or more fallow.

Putit, पतित, fallow.

Cultivated, खवादी, abadee.

Moisture, हाल, hal, moisture fit for the germination of seeds.

A paucity or moisture, मोटहाला, mothala, the same not sufficient.

Fertile land, गरावा, gurava, (a good mould.)

Exhausted land, गलुआ, gulooa, the crops on such rise a few inches and then dry up and die.

Hard clay, कठमाटी, kuthmatec.

Sandy dry soils, मर भूम, muroobhoom.

High land, रेखान, rekhan.

Low land, लीच, leea.

Dampness, सरदी, surdee, occasioning the crops to turn yellow.

Lands ploughed in January, साघात, Maghat, ploughed from Magh, the cultivation year.

Salee, साली, salee, lands with two crops on them.

Jungla, जंगला, lands roughly cultivated with inferior crops.

Grain, जिनिश, jinis, a thing, used also for all kinds of produce when cleaned, whether corn or roots.

## APPENDIX.

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### *Prospectus of an Agricultural and Horticultural Society in India.*

THE advantages arising from a number of persons uniting themselves as a Society for the purpose of carrying forward any undertaking, is now so generally acknowledged, that to detail them appears almost superfluous. Not only must the experience and knowledge of an insulated individual be far less than that of a body of men, but his means for making experiments and conducting necessary operations, must be proportionably more circumscribed. A body of men engaged in the same pursuit, form a joint stock of their information and experience, and thereby put every individual in possession of the sum total acquired by them all. Even the mistakes and miscarriages of its members when recorded, prove a source of advantage to the body, while the labours of every one communicate new energy to his associates, and thus produce exertions which would never have been made, had they continued in their individual capacity instead of uniting as a body. Men of enlarged minds have been long convinced of the great advantages to be derived from Societies of scientific men, and have occasionally recommended them; yet scarcely a Society was formed before the commencement of the last century, and no one before the year 1640.\* Since the commencement of the last century, however, their advantages have been more and more developed, so that there is now scarcely an object relating either to religion, to science, or to the promotion of arts and manufactures, which is not carried forward by a Society formed for that express purpose.



Among other objects, Agriculture has for some years been greatly promoted by Societies formed with that view in England and other countries. The benefits which have already arisen from them are almost incalculable, and the prospects opened by their present labours are of the most encouraging nature. The capabilities of the soil to enrich a nation to an almost indefinite extent, have been clearly demonstrated by their reports, and the present value of landed property in England compared with its former value, must convince any reasonable person, that among those objects for the promotion of which associations can be formed, there are few more important than the agriculture of a country.

The practical part of agriculture in all countries is conducted by men whose habits and circumstances, as well as their circumscribed means, dispose them to pursue the same routine of operations whether right or wrong, to which their predecessors were accustomed. They must necessarily be, to a great degree, ignorant of the methods practised in distant provinces, and on soils differing from those on which they reside, and are therefore found to be strongly prejudiced against every innovation, whatever advantages it may promise. An Agricultural Society by collecting information relative to the actual practice in different countries, or in different provinces of the same country, could not fail of discovering many errors in the management of land and stock, which it would endeavour to correct; while on the other hand modes of cultivation practised in particular districts would be recognized as superior and worthy of adoption elsewhere; the nature of different soils, and the advantages or disadvantages of particular crops, as well as of particular modes of management, would be better understood, the nature and value of stock and the most obvious means of improving it, be gradually developed, and, in short, innumerable improvements in every department would thereby be gradually introduced.

An Agricultural Society in India, therefore, which it is the object of this Prospectus to recommend, could not fail of producing the most beneficial results both as it respects

the Peasantry, the Landholders, the Europeans who engage in its promotion, and the country at large. It would tend to enlarge the ideas of the Peasantry, to dissipate their prejudices, to call forth their latent energies, to encourage their industry, and to promote their respectability and usefulness in society. It will be scarcely denied that the Peasantry of India are in a condition much below that in which the great body of English Farmers were previously to the forming of Agricultural Societies there; and yet these farmers have in many instances learned the art of raising upon the same land more than four times the produce they formerly raised, and to maintain themselves and their families in a much more reputable manner than they formerly did, notwithstanding the value of the land and consequently its rent, have been quadrupled. The Landholders would soon feel the benefits arising from the labours of an Agricultural Society in the increasing value of their estates, the greater comfort and happiness of their tenants, and the gradual cessation of those mean arts too frequently practised, in order to evade the payment of their rents. And every European who engages in promoting the interests of his fellow-creatures in India must feel a copious return of pleasure when he witnesses the success of his endeavours: indeed there are few who would not realize a continual source of enjoyment in viewing the improvement of this country, the increasing respectability and happiness of its inhabitants, and the advancement of pursuits which are in every country the most friendly to human happiness.

By associating Native Gentlemen of landed estates with Europeans who have studied this subject, and have made observations upon the practice of Agriculture in different countries, we should gradually impart to them more correct ideas of the value of landed property, of the possibility of improving it, and of the best methods of accomplishing so desirable an end, and should at the same time convince them of the importance of studying the true interest of their tenantry, and introducing improvements on their estates.

The draining of marshes, the cultivation of large tracts of country now not only useless, but the resort of savage beasts and the source of severe diseases—the improvement of stock—the creation of a larger quantity of the necessaries and conveniences of life, and of raw materials for manufactures—the gradual conquest of the indolence which in Asiatics is almost become a second nature,—and the introduction of habits of cleanliness, and a neat arrangement of domestic conveniences, in the place of squalid wretchedness, neglect, and confusion; in a word, of industry and virtue in the room of idleness and vice, might all, by an association of this nature in time become obviously important even to the natives themselves. These are some of the benefits upon which we may reasonably calculate as the consequences of an Agricultural Society in India; and every lover of mankind will undoubtedly acknowledge them to be such methods of doing good to his fellow-creatures as are worthy of his closest attention.

Were an Agricultural Society formed in India, its first endeavours would be directed to the obtaining of information upon the almost innumerable subjects which present themselves; it would thereby gradually accumulate a stock of knowledge upon every subject connected with those inquiries, which when embodied would comprize the total of the present ideas, the experiments, the general practice, and the proposed plans of a great number of individuals, combined indeed with a history of errors, mistakes, and failures, which however, though injurious to the individuals who make them, would be of the utmost advantage to society.

Agriculture being of the first importance to all countries, the methods employed to raise crops, and conduct the other parts of rural economy must so vary with soil, climate, and other local circumstances, as to make it impossible for any individual to be practically acquainted with them all. Too much praise can scarcely be given to local establishments whether public or private. They are of the greatest value in ascertaining the capability of particular districts to produce

certain crops, and in making important trials of particular modes of culture ; but it would be impossible to form establishments of this nature sufficiently extensive to admit those numerous experiments which must be applied to even a few of those diversified circumstances connected with the agriculture of a large empire, which comprizes every variety of situation and climate. For though Divine Providence has so ordered it that most of the culmiferous plants, which are of the first importance as articles of food, are able to bear almost equally the severe winters of the north, and the burning heat of the torrid zone, yet the mode of cultivation must be greatly varied to insure success in these different climates. It is also obvious that many plants which furnish useful and valuable crops in one climate, cannot be cultivated in another except as articles of curiosity ; hence that variety of plants and trees capable of being cultivated in different parts of India, and of forming rich fields, luxuriant gardens and orchards, and valuable forests of timber, of clothing the highest mountains and the deepest vallies, and overspreading the most extensive plains though composed of every variety of soil, renders necessary some plan which may stimulate and direct agricultural operations far more extensive than those which any local establishment can possibly embrace. By collecting the result of actual experiments and established practice in all situations, the members of an Agricultural Society would so embody and employ their accumulated information, as to make it contribute materially to the general good.

An Agricultural Society, among other things naturally presenting themselves, *would pay close attention to the Improvement of Land*, by encouraging a superior mode of cultivation, by ascertaining the best kinds of manure, and the best method of applying them, by encouraging neat workmanship, by draining, embankment, a proper rotation of crops, and a prudent management of stock, and by other methods which their united experience might suggest. It would be presumptuous to say that the mode of agriculture

used in any country is brought to such perfection as to make all attempts to advance it unnecessary. There is nothing human which does not admit of improvement; how much then must remain to be done in a country where the same system with scarcely a single variation, has been persisted in for many centuries! Indeed we may safely aver, that so far as regards improvement, almost every thing remains yet to be done.

It is only a few years since any tolerable information upon *the best method of properly cropping Land* and of the best rotations of crops in particular situations, was obtained in Europe, and it would be unfair therefore to suppose that any thing respecting it is known to the natives of India. In many parts of this country the same crop is invariably raised on the same ground year after year; and if ever an alteration is made, it depends more upon the kind of seed the farmer happens to have by him, than upon the nature of the land, or upon his wish to improve it. It is probable that the distinction between those crops which improve, and those which deteriorate the soil, is totally unknown in India, and that a scientific rotation of crops is a subject to which all cultivators are strangers. The same may be said of manure, the greatest part of which is generally consumed for fuel, without any idea of its value to enrich the soil, or of the quantity which ought to be used to produce the greatest effect.

Another object to be pursued by an Agricultural Society is, *the introduction of new and useful Plants*. That there are great numbers of plants suited to the soil and climate of India beside these already cultivated, no one will deny. The great and increasing demand made by the arts and manufactures upon the produce of the soil for particular productions, is such as to require a variety of plants suited to every soil and calculated to furnish crops for all sorts of land; and it only requires the united efforts of public spirited men to bring these articles to notice and encourage their cultivation.

*The improvement of Implements of Husbandry*, has occupied the attention of some of the first mechanics in Europe, in countries where, previously to these improvements, the meanest implement far surpassed the best which is to be found in India. This would naturally be an additional object of the Society now proposed. The Europe Plough and the Harrow, the Scythe and the Sickle, the Fork and the Rake, with the Cart to carry the produce of the soil to the Farmer's yard; and a great number of other desirable implements must, it is true, be introduced by slow degrees, and their utility clearly proved, so as to induce the indigent farmers of Hindoosthan to discern their usefulness and ultimately adopt them in practice. But that they might thus be introduced there can remain little doubt.

No attempt to improve Stock, appears ever to have taken place in India, but every thing has been left to nature; there is however every reason to think that the breed of Horses, Cows, Sheep, Goats, Swine, and of every other useful animal, might be improved as effectually as it has been in other countries, were proper means employed to accomplish the end. The quantity of milk in cows might undoubtedly be increased, the quality of wool might be improved, a stronger and more useful race of cattle both for draught and burden might be gradually introduced, and in short every thing might be expected from persevering attempts to improve those animals which come under the denomination of stock, whether intended for Labour, the Dairy, or for Food. This then would form a proper object to call forth the exertions of an Agricultural Society.

But another object which it is exceedingly desirable to encourage, is, *the bringing of Waste Lands into a state of Cultivation*. The quantity of land in India now lying uncultivated, is so large as almost to exceed belief: extensive tracts on the banks of the numerous rivers, are annually overflowed, and produce little except long and coarse grass, scarcely eaten by cattle when young and tender, and never attempted to be made into hay, or to be turned to any use.

ful account, that very small part excepted which is employed in thatching the houses of the natives. During the rains these tracts are the haunt of wild buffaloes, which in the night come up from them and devour the crops of rice on the higher lands, and in the cold season wild hogs, tigers, and other noxious animals unite with the buffaloes in occupying these pernicious wastes. The securing of these from inundation by embankments or by other methods, is an object of prime importance, as it respects the security and healthfulness of the country; and the increase of good meadows, or valuable arable land, would add greatly to its prosperity. The same observations will apply to the vast tracts which are now wholly overrun with wood; and which being entirely neglected, and neither valuable as forest, pasture, nor arable land, subtract from the salubrity of the country, and prove a nuisance to the surrounding districts by affording shelter to great numbers of noxious animals.

In a country like India, where, even in those parts which have been longest under the British dominion, though ample security is given to the property of all, the oppressions of land-owners and petty officers are with difficulty restrained, where the cultivators of the soil are considered as mean and beneath the notice of the higher parts of the community, where indolence so pervades all ranks as to reduce the whole to an inert mass, and where, in all the districts not subject to Britain, the whole population has been constantly exposed to such flagrant injustice and oppression, that no one could reasonably promise himself security for a single night; it is natural to suppose that Agriculture should be in many parts entirely neglected, and in others partially followed, and that under great disadvantages. Thus one of the finest countries in the world, comprising almost every variety of climate and situation, diversified by hills and valleys, intersected in every part by streams, most of which, navigable six months in the year and many of them through the whole year, afford every facility for carrying manure to the land and every part of the produce to market, as far as it respects its Agricultural interests, is in the most abject and degraded state.

It is also known and lamented that the state of Horticulture in this country is almost as low as that of Agriculture ; so that except in the gardens of certain Europeans who at a great expense procure a few articles for the table, there is nothing to be met with beside a few wild herbs, or garden productions of the most inferior kind. All that is seen of orchards, amounts to no more than clumps of mango trees crowded together without judgment, and in which the quality of the fruit is but little consulted. The improvement of fruits is almost neglected, and every thing which can contribute to the furnishing of our tables with wholesome and agreeable vegetables, and fine fruits, is yet to be commenced ; not to mention that ornamental gardening is scarcely known. We depend upon Europe for seeds, of which, when we have obtained them at a great price, scarcely one in five hundred vegetates, and even after it has sprung up, seldom comes to perfection, through the ignorance or negligence of the native gardeners. It is notwithstanding, well known, that one part or other of India would suit every production, and bring every kind of seed to maturity, so that by a free communication, those parts of the country in which the seeds of particular plants do not come to perfection, might be easily supplied with them from others, and useful plants and fruits might be gradually acclimated so as to be plentiful in every part of India. The introduction of the potato, and more recently of the strawberry, are sufficient to shew that the attempts of insulated individuals have not been in vain. How much more then might be accomplished by the joint efforts of a number of persons arduously engaged in the same pursuit !

The giving of premiums for successful cultivation, for neat and well managed work, for the improvement of waste lands, for the successful cultivation of a crop of any new and useful plant, the improvement of stock, and the invention or improvement of any implement of husbandry would, in all probability, contribute much to call forth the talents of the inhabitants of this country, and stimulate them to exertions, which would be necessarily followed by the desired improve-



ments in a greater or less degree. By an Agricultural Society, premiums could be given to deserving individuals as a reward for such operations, as might be laid down in its rules. And as the only way by which improvements may be communicated and modes of culture made known is, by publishing reports of the proceedings of Societies, and communications from individuals describing either successful or unsuccessful practice, it would be desirable that such a Society publish its Reports at stated periods in the English language, and in at least two of the languages of the country.

It seems highly desirable therefore that a Society should be formed in India, for the encouragement of both Agriculture and Horticulture, under any name which may be agreed on by gentlemen who may engage in its formation. The Funds requisite for carrying on its operations, might easily be furnished by each member's subscribing eight rupees quarterly, and any gentleman subscribing four hundred rupees might be a member for life. The business of the Society might be conducted by a President, two Vice-Presidents, and a Committee to be chosen annually. Each member might pay on his admission a sum of not less than a gold mohur. It is peculiarly desirable that Native gentlemen should be eligible as members of the Society, because one of its chief objects will be the improvement of their estates, and of the peasantry which reside thereon. They should therefore not only be eligible as members, but also as officers of the Society in precisely the same manner as Europeans.

It is from a sense of the importance of this subject to the future welfare of India, that the writer of this letter has thus taken the liberty to recommend it to the consideration of gentlemen who reside in various parts of the country, without whose cordial co-operation nothing of this nature can ever be attempted, and from any of whom he shall feel honored by a letter on the subject. And both in forming such a Society, and in subsequently promoting its objects, important to the happiness of the country as they regard them,

the writer and his colleagues will feel happy in doing all their other avocations will permit.

W. CAREY.

*Mission House, Serampore,  
April 15, 1820.*

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At a meeting held in the Town Hall, Thursday, Sept. 14th, by a number of gentlemen, European and Native ;

C. TROWER, Esq. *in the Chair.*

It was resolved, that a Society be formed, to be denominated, "The Agricultural Society of India," of which the following Rules should form the basis :

1st. That the promotion of Horticulture in India be considered by this Society as a branch of its main object.

2nd. That gentlemen of every nation be eligible as members ; and that all members, after the formation of the Society, be admitted by ballot of a majority of the members then present.

3rd. That a President, two Vice-Presidents, two Secretaries, and a Treasurer be chosen, and a Committee appointed to examine papers and conduct the business of the Society, of which the President, Vice-Presidents, and Secretaries will be members *ex officio*. That one of the Vice-Presidents and one of the Secretaries, be Europeans ; and the others Natives of India. The President to be always a European.

4th. That to form a fund for carrying into effect the objects of this Society, every member (Honorary ones excepted) shall on his admission pay the sum of eight rupees, and afterwards a quarterly subscription of eight rupees, or if he prefer it, the sum of four hundred sicca rupees at one time, which will constitute him a member for life.

5th. That Meetings of the Committee be regularly held every three months, at which Papers shall be read, and the business of the Society transacted.

6th. That Gentlemen in every part of India be requested to communicate to the Secretaries their observations upon the

cultivation of the different districts in which they reside, pointing out their merits or defects, and suggesting those improvements which may occur to them.

7th. That the Transactions of the Society be published in English, and in two at least of the languages of India, as often as a sufficient quantity of information be collected.

8th. That the Committee of Papers be authorized to draw upon the Treasurer for any sum requisite to defray the expenses of conducting the affairs of the Society, such as printing, postage, or the like, and that an order for such sums signed by a majority of the Committee, be a sufficient warrant to the Treasurer for paying the same.

It was further Resolved—

That the Most Noble the MARQUIS OF HASTINGS be respectfully requested to become the Patron of this Society.

That, as several gentlemen who have sent in their names as Members, were unable to be present, another Meeting be held in the Town Hall at 10 in the forenoon, on Monday October 2nd. for the purpose of chusing the Officers of the Society.

At a Meeting of the Agricultural Society held Dec. 14, 1820, it was agreed that Dr. Carey be requested to draw up a paper stating the objects of the Society, and to send it in circulation to the members of the Committee, that it may be read at the next meeting, with the observations of the Committee, and afterwards sent to the different members of the Society.

At a Meeting of the Agricultural Society held March 11, 1821, at the house of W. Leycester, Esq. a manuscript copy of the annexed letter, addressed to the members of the Society was produced by Dr. Carey, and being approved, was ordered to be printed and circulated.

SIR,

The Agricultural Society, desirous of obtaining correct information upon every circumstance which is connected with

the state of Agriculture and Horticulture in the various provinces of India, request your attention to the following objects, and will be happy to receive any information upon the whole or any part of them as may suit your convenience.

1. What is the distinguishing character of the climate in the district where you reside ? This inquiry refers particularly to its dampness or dryness, and the prevailing degree of cold or heat ; also to its being sheltered or exposed, and the effects of these circumstances upon the productions of the soil.

2. What is the nature of the Soil ? Is it argillaceous, calcareous, or sandy ? What the substrata ? What its elevation, whether it contains low swamps, fertile plains or hills ? and if it be mountainous, what the elevation of the hills, and their fitness or unfitness for Agricultural purposes ?

3. What are the facilities for disposing of the produce ? Whether there be a facility of water carriage from the remote parts of the district to the larger towns, or whether the produce be conveyed by land carriage ?

4. What are the rents for the different kinds of Land ? What the customary burdens which the tenants have to bear beside their rents ? and what the security which a tenant has of continuing in the occupation of his farm provided he pays his rent ?

5. What is the general size of the Farms ? and whether a certain quantity of Land, properly defined, be let as a compact farm, or whether the tenant only pays for what he actually cultivates ?

6. Whether there be any regular system of irrigation, and if so to what extent it is carried ; whether merely to land cultivated with rice, or to grass lands, and those cultivated with other articles of produce ?

7. What is the general arrangement of Agricultural labours ? Are servants employed ? and to what extent ? What are the hours of field labor ? and what those of domestic labor ? —Do the cattle work morning and evening and rest in the heat of the day ; or is any other mode of management pursued ?

8. What are the kinds of live Stock ? How many oxen or other cattle are required to cultivate a given quantity of land ? Is any attention paid to the improvement of the breeds of Cattle ? Are dairies common ? What is the quantity of milk produced on an average by a cow ? What quantity of cheese, butter, or ghee produced from a given quantity of milk ? What the process used to produce those articles ? What are the breeds of sheep, and what the quality of the wool ? Is the fattening of cattle for slaughter attended to ? and to what extent ? Are the cattle turned loose to get their food in the fields, or fed at home on produce cultivated for them ? If so, what are those particular crops employed for that purpose ? Are any attempts made to improve the breeds of cattle ?

9. What are the usual implements used in Husbandry ? and have any attempts been made to improve those in common use, or to introduce others more effectual ? Do you know of any public-spirited men of property who would be likely to make experiments on their estates with improved implements ?

10. What is the state of cultivation, what the different articles cultivated, and to what extent respectively ? What is the season for sowing, and reaping the different crops ? Is there any alternation of crops, and what is the rotation usually observed ? Are the fields kept clean from weeds, and by what method ?

11. Are any attempts made to cultivate waste lands and to improve land in general ? What is the quantity of waste land within the district where you reside, and of what description is it ? Are embankments carried on to any extent ? and what is the method usually employed in making them ?

12. What is the state of the country around you ? Are the farms enclosed ? or are the lands of different tenants intermixed in open fields ? Is any attention paid to draining ? and what are the methods employed to clear the lands of superabundant moisture ?

13. Is any system of manuring observed ? What are the

kinds of manure employed ? In what state are they put upon the land, and in what quantities to the bŕga ?

14. Is any, and what proportion, of the lands in your district employed as grass land ? and of what kind ? Is it upland, or meadow ? Are any attempts made to cut and convert the grass into hay ? What are the facilities for improving grass land, making hay, and applying that kind of produce more effectually to the feeding and improvement of stock ?

15. Is there any disposition in your part of the country to cultivate gardens, either for use or ornament, and to what extent ? Can any of the productions of Europe be brought to perfection ? Do those plants which are common in Europe thrive with you in the rainy season ? Do beans, peas, cabbages, cauliflowers, turnips, and other productions perfect their seeds, and retain their qualities, or do they degenerate ? Is it not possible to improve the various sorts you have in the manner they are improved in Europe ?

16. Is any attention paid to Orchards ? What are the principal fruits cultivated ? What attention is paid to the improvement of them by grafting, budding, or raising new varieties from seeds ? Are any attempts made to introduce new species or varieties from other countries ?

17. What is the state of woods or timber plantations ? Have any new plantations of useful timber been made, and what has been the method pursued ? What are the usual timber trees in the district, and what the species which may be cultivated to most profit ? Is the under-wood considered as valuable ? or thrown away as useless ?

18. What do you think are the obstacles to agricultural improvement, and what do you suggest as the most appropriate remedies to them ?

19. In what manner do you think the comforts of the peasantry around you could be increased ? their health better secured, and their general happiness promoted ?

20. In what manner do you suppose useful knowledge on these subjects may be best obtained and diffused ?

W. CAREY. .

NOVEMBER 21, 1821.

The following letter from the Governor General in Council, giving to the Society 1000 rupees per annum, was read :—

To W. LEYCESTER, Esq.

*President of the Agricultural Society of India.*

SIR,

The Most Noble the Governor General in Council desiring to evince the sense which he entertains of the great public importance of the objects contemplated in the formation of the Agricultural Society of India, and to mark, by a public act, the interest which he takes in its progress, has been pleased to grant to that Institution a donation of Sa. Rs. 1000, to be distributed by it in honorary prizes after the manner followed by the Agricultural Associations in England, with such modification as local circumstances may suggest. .

2. The same donation will be annually granted hereafter subject to the approval of the Honorable the Court of Directors.

3. The Sub-Treasurer will be desired to pay the amount to the Treasurers of the Society.

I have the honor to be,

Sir,

Your most obedient servant,

HOLT MACKENZIE,

*Council Chamber, Nov. 9, 1821.*

*Sec. to the Govt.*

MARCH 20, 1822.

Mr. Kyd presented to the Society a model of a Thrashing Machine. On the proposal of Dr. Carey the following premiums were agreed to.

1. One hundred rupees or the Gold Medal to the most successful cultivator of Coffee on not less than ten bigas. The mode of culture to be stated and the produce, and a quantity not less than a maund to be placed at the disposal of the Society.

2. A hundred rupees or the Gold Medal for the most successful cultivation of any improved or superior species of Cotton, beside the commonly cultivated species, on not less than ten bigas. Vouchers of the mode of culture and produce are required. A quantity not less than a maund to be sent to the Society.

3. One hundred rupees or the Gold Medal to any person who shall successfully introduce into Bengal, Behar, or Orissa, any esteemed species of European fruit, apple, pear, plumb, cherry, apricot, nectarine, strawberry, raspberry, gooseberry, or currant. A quantity not less than four seers to be presented to the Society.

4. One hundred rupees or the Gold Medal to any person who shall succeed in producing any new and improved varieties of any of the fruits indigenous to India, a quantity not less than ten seers to be presented.

5. One hundred rupees or the Gold Medal to any person who shall successfully cultivate the mangosteen, doorian, or other fruits peculiar to the Eastern Islands.

6. Fifty rupees or the Silver Medal to any person who shall make Cheese equal to Warwickshire. An account of the process employed, and a Cheese weighing not less than ten pounds to be sent to the Society.

It was also proposed by Dr. Carey to commence printing an octavo Volume of the Society's transactions, and to print them in English, Bengalee, and Hindoosthanee. The proposal was agreed to.

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At an Extra Meeting of the Agricultural Society held at Calcutta, on Monday, the 9th December, 1822.

Proposed by Mr. Wood and seconded by Mr. Leycester, that in acknowledgment of the well directed and anxious desire which has for so many years encouraged and enlarged the pursuits which now unite us together as a Society, and in token of our sense of the honor and obligation, which the Society in its most infant state received from her condescen-



sion in becoming our Patroness. We express our anxious wishes, that the Most Noble the Marchioness of Hastings will honour us by indulgently sitting for her picture, to be placed in one of the principal pannels in the house at Titigur.

In pursuance of the wish above expressed by the members present at their meeting, Major General Hardwicke, and Mr. Leycester waited upon the Marchioness of Hastings, who received the expression of the desire of the Society to be honored with her picture with much cordiality, but postponed giving a final answer until she had consulted the Marquis of Hastings. Mr. Leycester is happy in communicating the following note from the Marchioness of Hastings, complying with their wish, and he also records a note written to Mr. Chinnery in furtherance of the object.

TO WILLIAM LEYCESTER, Esq.

DEAR SIR,

I have consulted Lord Hastings upon the flattering request conveyed by you from the Agricultural Society, and he has overcome my objection by saying, that in acceding to the particular distinction, which the Society has done me the honor to wish, I shall not lay myself open to any charge of desiring to render myself prominent beyond my proper province, while I can feel, that in compliance with it, I can alone testify my gratitude for the compliment intended for me. May I therefore beg you to be the channel of conveying my acknowledgment for this very unlooked for expression of good will.

I have the honor to be,

Dear Sir,

Your very obdt. servant,

(Signed) F. HASTINGS

*Govt. House, 9th Dec. 1822.* and (MOIRA) LOUDOUN.

To G. CHINNERY, Esq.

DEAR SIR,

The Agricultural Society, of which I am President, having requested the Marchioness of Hastings (the Patroness of the Society) to honor them by sitting for her picture to be placed in one of the rooms of the Titigur house; I beg the favor of you to adopt the proper measures to obtain her Ladyship's consent, for her sitting to you for her picture at any time the Marchioness may appoint. In looking over the Titigur house the most appropriate pannel seems to be about five feet square, from which the width of the frame, of course, is to be deducted. If you can make it convenient to come over here on Wednesday morning, any time between 10 and 11 o'clock, any thing that may not be perfectly understood by this note can be fully explained.

I am,

Sir,

Yours obediently,

(Signed) W. LEYCESTER.

*Titigur, 10th Dec. 1822.*

At a Meeting of the Society held at the house of the President, on Wednesday, the 12th March, 1823.

Read a letter from the President recommending that a collection of engrafted fruit trees be ordered out from England for the use of the Society to the amount of £100 and that a native man of the country be sent home for the express purpose of taking charge of the plants on their way out.

Resolved, that the Society unanimously and heartily concur in the preceding proposition, and that the opportunity at present offering itself by the immediate departure of the Princess Charlotte for Liverpool should be used for making the requisite application to Mr. Shepherd, the Curator of the Botanic Garden at that place, and Capt. McKean of the abovementioned vessel being the fittest person to whom the Society could entrust the care of the grafts, that an applica-

tion be made to him with the view of securing his valuable services on his next voyage out to Bengal. Resolved further, that the Secretary be authorized to apply to the Treasurers for a set of bills to the amount of £100 exclusively for the purchase of the collection, and be directed to take immediate measures for carrying the above resolutions into effect.

At a Meeting of the Society held at Chowringhee, on Wednesday, the 10th September, 1823.

Resolved on the proposition of the President, that Lord and Lady Amherst be solicited to become the Patron and Patroness of the Society, in succession to Lord and Lady Hastings. Further, that the President be requested to prepare a suitable address in the name of the Society, and to take an early opportunity of presenting the same.

At a Meeting of the Society held at the house of the President, on Wednesday, the 19th November, 1823.

Read the following letter addressed by the President to Lord Amherst, on the 15th October, and the reply of the same date, complying with the request of the Society for his Lordship and Lady Amherst becoming their Patron and Patroness.

TO THE RIGHT HONORABLE

LORD AMHERST,

*Governor General,*

*&c. &c. &c.*

MY LORD,

I am instructed by the Agricultural and Horticultural Society of India to wait upon your Lordship, and in testimony of their respect and deference to solicit, that your Lordship will honor the Society by becoming their Patron. I am also desired to express our hope that through your Lordship's interference, Lady Amherst may be graciously disposed to receive the Society under her Ladyship's protection as Patroness of the Institution.

We are persuaded, my Lord, that the countenance of your Lordship and of Lady Amherst, as our Patrons, will tend

very materially to promote the views and objects of our Society, and in anticipation of your Lordship's acquiescence we feel assured, that our prayer will not be considered in the light of mere formality, but that in addressing ourselves to Lord and Lady Amherst, we are appealing to minds, from habit and reflection duly appreciating and warmly attached to the various interests of Agriculture, on which the happiness of the people and the prosperity of the country so materially depend.

We shall thus, my Lord, be instigated by increased vigor in our undertaking, and though the operations of a Society constituted as ours, must necessarily be slow, we shall confidently look forward to a time when we may feel certain that under the successive Patronage of the Marquis and Marchioness of Hastings, and of Lord and Lady Amherst, the interests of Agriculture and Horticulture have been advanced in some degree through the endeavours of our Society.

I have, &c.

(Signed) W. LEYCESTER.

Titigur, 15th Oct. 1823.

W. LEYCESTER, Esq.

*President of the Agricultural and Horticultural Society of India.*

SIR,

I am to acknowledge the receipt of your letter of this day's date proposing to Lady Amherst and to myself the high honor of placing our names at the head of the Agricultural and Horticultural Society of India.

We accept, most readily and thankfully, the distinction which your Society is pleased to confer upon us.

Your Society does justice both to Lady Amherst and to me, in believing that we regard not your flattering proposal as a mere formality.

We feel the warmest interest in the success of the objects embraced by the Agricultural and Horticultural Society, and we shall be proud to find ourselves associated with those

patriotic individuals, whose pursuits are directed to the substantial and permanent improvement of the British territory in India.

Wishing success to your important labors, and returning my thanks to you, Sir, individually for the manner in which you have conveyed to me the instructions of your Society,

I have, &c.

(Signed) AMHERST.

*Barrackpore, 15th Oct. 1823.*

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At a Meeting of the Agricultural Society held at the Town Hall, on Wednesday, the 17th March, 1824. The Rev. Dr. Carey in the Chair.

Resolved, that the thanks of the Society be returned to Baboo Ram Kzumul Sein for his communication, and that the following rules be adopted on the propositions submitted by him, viz :

1st. That members shall not be liable to be called upon for any amount of Quarterly contributions during their absence from India.

2nd. That members thus absent are still to be considered as members of the Society and to continue as such in their list.

3rd. That members who may return to India are to be called upon for the liquidation of any arrears, which may have been due to the Society previous to their departure from the country.

4th. With reference to the amount of the outstanding debts, it is resolved, that any member who shall decline discharging his arrears twelve months after their becoming due, on proper notice being given, shall cease to be considered as a member of the Society and his name shall be struck off from their list.

At a Meeting of the Agricultural and Horticultural Society held at the Town Hall, on Tuesday, the 18th May 1824. The Rev. Dr. Carey, President, in the Chair.

Resolved, with reference to the difficulty of collecting the small sums of the Quarterly contributions, and to the heavy arrears of subscriptions due to the Society, which are the more inconvenient as funds are wanted in order to meet expenses of the intended publication of their researches, that the Quarterly contributions of the members, be henceforth consolidated into one sum (thirty-two rupees) to be paid in advance, and to become due on the 1st January. This arrangement to take effect from the beginning of next year.

Read the opinions recorded by the Committee on the selection of the papers, which are to be included in the first volume of the Researches of the Society.

Resolved, that the sentiments of the Committee be adopted, that the volume be printed in octavo at the Serampore Press; that it be preceded by a preliminary discourse, which the Reverend President announces to the Society that he is preparing for that purpose, and that a General History of the origin and progress of the Society elucidated by the necessary documents and extracts from the proceedings, be appended. Further, resolved that the Secretaries be desired to take such ulterior measures as may be required to carry the preceding resolutions into effect.

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At a Meeting of the Agricultural Society held at the Town Hall, on Tuesday, the 13th July 1824. Dr. Carey in the Chair.

Dr. Wallich announced to the Society that the collection of fruit trees, which have been ordered out from Liverpool a year ago, had arrived on the Princess Charlotte in excellent order, owing no doubt to the great care which had been bestowed on their selection and package by Mr. Shepherd of that institution, whose letter dated the 11th November, with an enclosed list, was read and recorded

and to the particular attention shewn to the despatch on its passage out by the commander Captain McKean.

Resolved, that the warmest thanks of the Society be returned to the President and Committee of the Liverpool Botanic Garden for their obliging attention in promoting the wishes of the Society by allowing their Curator and Gardeners to pack up the fruit trees for despatch to India, and to Mr. Shepherd and to Captain McKean for their valuable and successful aid on this occasion.

Proposed by Dr. Carey and unanimously resolved, that Mr. Wilson be requested to undertake forming a suitable devise and inscription for a medal of the Society, and that he be further solicited to take the necessary measures to get it properly engraved, of a size corresponding, generally, with that of the honorary Medal of the College of Fort William.

At a Meeting of the Agricultural Society held at Calcutta, March 1825. Rev. Dr. Carey in the Chair.

A maund of Coffee presented by Mr. Lamb from his plantation at Dhacca, in conformity with the resolution of the Society proposing a medal or reward for the first produce of that extent.

Resolved, that Mr. Lamb be presented with the Gold Medal of the Society.

At an Extraordinary Meeting of the Agricultural Society held at Calcutta, on the 9th June 1826. President, W. Leicester, Esq.

Resolved, although an obvious right would justify the enforcement of the resolutions passed on the above occasion, the Society prefers adopting the less disagreeable mode of procedure by directing their Secretary to address a circular to their debtors, requesting them to pay up their arrears without delay, thereby enabling the Society to carry on its labours.

Read a letter from Henry Wood, Esq. dated the 4th, recommending a medal to be given to every individual who may produce satisfactory proof on the 1st January 1828, of having successfully reared the greatest number of Spanish chesnuts and olives.

Resolved, that thanks be returned to Mr. Wood, with an intimation that the Society propose adopting his suggestion.

Resolved, the deficiency both in quality and quantity of the supplies of fruit and vegetables in the bazars of Calcutta appears to be an object in every respect worthy of the Society's attention. Considering the excellent description of those articles which may be reared in Bengal, and the very trifling addition in point of trouble and expense which would be required to bring the greens and fruit market to a great degree of perfection, the Society are desirous of encouraging and assisting the native cultivators by distributing gratuitously seeds among them, and by holding out pecuniary rewards to those who may satisfy the Society of having judiciously and successfully availed themselves of the opportunity thus afforded for ameliorating so useful a branch of husbandry. For the present the Society contemplate only a sort of experiment intended to ascertain how far their interference may prove useful; they accordingly resolve to limit themselves in the first instance to procuring a supply of kitchen garden seeds from home to the amount of £50 and offering a reward of 50 rupees to any person who shall produce before the Society the earliest and best quality of the following articles at the ensuing seasons, namely, peas, cauliflowers, potatoes, artichokes, and strawberries.

Resolved, that the Secretary take the requisite measures with the view of giving effect to the foregoing resolution, and that he be directed to give publicity to them by public advertisements in the daily papers, and by hand bills in the Bengal and Hindostanee languages.

Read a letter from H. H. Wilson, Esq. dated the 31st May, tendering his resignation as Vice-President to the Society.



Resolved, that the cordial thanks of the Society be tendered to Mr. Wilson for his past services, and that the Rev. Dr. Carey be requested to accept of the situation of Vice-President, of which the Reverend Gentleman signified his acceptance.

The native Secretary informed the Meeting, that Captain Cheap of the Engineers, had withdrawn his name from the list of the Society.

On the intimation from Dr. Wallich respecting his approaching botanical tour to the Eastward, Mr. C. K. Robinson offered his services, and was accordingly nominated to act as Secretary to the Society.

#### AUGUST 9, 1826.

In reference to the public advertisement of prizes ordered at the last Meeting, the President proposed that he should be allowed to expend 500 Rs. in the purchase of the best Europe, Cape, New South Wales and Patna garden seeds procurable for the purpose of being distributed among intending competitors for the prizes in terms of the advertisement. The Meeting approved of the proposal. The President proposed that the Society should remit Rs. 1000 or £100 to Liverpool for the purpose of procuring next year a supply of fruit trees similar to those now received but including mulberries, and a variety of rose trees. The Meeting approved of the measure and directed the remittance to be made according to the President's proposal.

Mr. Ainslie offered his services in procuring seeds and plants from the Horticultural Society at Van Dieman's Land, which offer was accepted by the Society, and he was accordingly requested to procure these to the extent of £20 including all charges, and to consist chiefly of vegetables and grains; the potatoes to be carefully packed in small casks of dry sand.

The President proposed that the thanks of the Society be offered to Mr. Roscoe and Mr. Shepherd of Liverpool, for

the great trouble taken by them in procuring this importation of plants, also to Captain Richmond of the North Briton, for the care taken of the plants on the passage.

CALCUTTA, JANUARY 1, 1827.

At a Meeting of the Society held at the house of the President William Leycester, Esq. called by public advertisement for the purpose of examining the various specimens of Vegetables offered by native gardeners, and awarding the medals and prizes of the Society.

The Meeting thereafter proceeded to the examination of the vegetables produced, and having called for the specimens of Potatoes offered by intending candidates, only one candidate for this prize appeared, namely, Ram-tunoo of Gobra near Intally, the silver Medal and forty rupees in money were awarded him.

The silver Medal, and forty rupees were awarded to Huludhur of Intally, for the best Peas.

For this prize the gardener of a Mr. Fenwick was also a competitor and produced the best specimen, but after some consultation it was decided that the prizes were confined to native cultivators only.

The silver Medal, and forty rupees were awarded to the same Ram-tunoo of Gobra, for the best specimen of Cauliflower.

For this prize the gardener of Simon Fraser, Esq. was a competitor, but although he produced the best specimen, he was in like manner prevented from competing.

The specimens of Cabbages produced by Huludhur Ghose and Ram-tunoo were so nearly equal in point of quality, that the Meeting awarded the Medal and twenty rupees to Ram-tunoo and twenty rupees to Huludhur.

—The Meeting was much disappointed at the small number of competitors, which was the more surprizing after so much

pains taken in distributing seeds, and circulating in Bengalee the notice of the Meeting.

The Secretary read to the Meeting a letter which he had lately received from the Secretary in the Territorial Department, acknowledging the receipt of the letter from the Society ordered on the 18th October, and expressing the readiness of Government to afford the Society the use of a piece of ground for a garden, if such a spot could be found out in the vicinity of Calcutta, and it should appear that giving the same to the Society did not interfere with the general interests of Government. Upon these points, however, the Society was instructed to communicate with the Board of Revenue and Collector of Calcutta.

Thereafter the Meeting adjourned.

#### CALCUTTA, JANUARY 12, 1827.

The officiating Secretary having received the following communication from Mr. Leycester, circulated the same amongst the members of the Managing Committee along with the annexed circular.

With reference to the paucity of competitors on the 1st of January, a circumstance from the number of dalees, which have been brought since obviously ascribable to the want of information by the native gardeners, it is worthy of consideration, whether it may not be expedient to have another shew, say on next Wednesday week, with the same distribution of medals and prizes ; it is no great cost, and we shall at all events see the people and they will see that we are interested about them.

If agreed to, I can easily send notice to about eighty men to whom I gave seeds.

## CIRCULAR.

*To H. H. Wilson, William Ainslie, George Ballard, Edward Barnett, Esqs. The Honorable C. R. Lindsay, and Dr. Carey, members of the Committee of the Agricultural and Horticultural Society.*

The officiating Secretary has the pleasure of circulating among the members of the Committee of Management a proposal on the part of Mr. Leycester to make a second distribution of medals and prizes for the best Potatoes, Cauliflowers, Cabbages and Peas, on Wednesday se'night, and the officiating Secretary requests the several members of the Committee to signify their consent or otherwise.

13th Jan. 1827.

I entirely approve of Mr. Leycester's proposal.

(Signed) E. BARNETT.

And I,—an intimation of the time and place should be sent to the Bengal newspapers.

(Signed) H. H. WILSON,  
W. AINSLIE,  
G. BALLARD.

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CALCUTTA, JANUARY 24, 1827.

At a Meeting of the Agricultural and Horticultural Society held at the house of the President at 10 o'clock this day, for the purposes mentioned in the preceding Circular, and after public advertisement thereof.

The Meeting examined the specimens of vegetables and fruits brought forward by about fifty native gardeners, and awarded the following medals and money prizes.

The silver Medal and Rs. 40 to Yusuf malee, of Moochee-khola, for the best Potatoes raised from Cape seed.

The silver Medal and Rs. 40 to Suroop-das, of Mootee-jeel, for the best Peas; a very fine specimen.

The silver Medal and Rs. 40 to Jaroola malee, of Allipore, for the best Cauliflowers, (very fine, 6 pounds weight).

—The silver Medal and Rs. 40 to Pitumbur-das malee, of Moochee-khola, for the best Cabbages, (10 to 12 seers weight).

It was proposed by Commodore Hayes, and seconded by Mr. Wilson and carried unanimously—that prizes of Rs. 10 and Rs. 8 each, should be given to such as have not gained the above prizes, but who produced creditable specimens of vegetables and fruits.

	Brought down,	160	0
To Hailbut Ullah, Kidderpore, for Peas, Cabbage and Turnips, . . . . .		10	0
Kuchil malee, of Allipore, for Cauliflowers, . . . . .		10	0
Golam malee, of Allipore, for Cauliflowers, . . . . .		10	0
Benut malee, of Kidderpore, for Beets, . . . . .		10	0
Haro-das, of Kidderpore, for Cauliflowers and Cabbages, . . . . .		10	0
Golab malee, of Sonae, for Peas & Cauliflowers, . .		8	0
Gooroo-churun malee, of Kidderpore, for early Manoes, . . . . .		8	0
Sunyasee, of Guapore. for Guavas, . . . . .		8	0
Radhoo, of Intally, for Guavas, . . . . .		8	0
Joogul, of Bhuyadanga, for Peas and Cauliflowers, .		8	0
Bachoo, of Intally, for Knolcole, . . . . .		8	0
Ram-tunoo, of Intally, for Red Cabbage, . . . . .		8	0
Kassee-nath das, of Clitpore, for Cauliflowers, . . .		8	0
Shaik Baruddin, for Cauliflowers, . . . . .		8	0
Durpa-narayun, for Peas, . . . . .		8	0

Total Rs. 290 0

The following are the dimensions and weights of some of the specimens exhibited to the Meeting.

Cabbages, firm and white, from 20 to 24	lbs.*
Cauliflowers, . . . . . 6 to 8	lbs.
Knolcole, . . . . . 3	lbs.
Turnips, . . . . . 2	lbs.
Potatoes, . . . . . 3½	lbs. in long.
Cauliflowers, 8 inches diameter.	
Cabbages, 10 ditto ditto.	
Turnips, 6 inches ditto.	
Knolcole, 5½ inches ditto.	

C. K. ROBISON.

At a Meeting of the Agricultural and Horticultural Society held within the hall of the Asiatic Society, on Monday, the 16th April 1827, at 9 o'clock, A. M. for the purpose of examining the Strawberries and Asparagus to be exhibited by the candidates for the prizes given by the Society.

The Meeting having examined the specimens of Strawberries produced, resolved that the silver Medal of forty rupees could not be awarded to any of the candidates, only three males having brought any, and those of so poor a quality, and so small in point of quantity, that according to the advertisement, this prize was not deserved.

The Meeting next examined the various specimens of Asparagus produced, and derived the greatest satisfaction from these. The specimen produced by Pitumbur-das, of Mootee-jeel, was declared the best in point of regularity, cleanness and color, and the silver Medal and forty rupees were therefore awarded him.

100 heads cut to  $8\frac{1}{2}$  inches long weighed 3 lbs. 15 oz.

It was proposed by Mr. Wilson and carried unanimously, that prizes of 10 rupees each be given to the eight males who produced the most creditable specimens of vegetables and fruits to the Meeting, for many different kinds were exhibited. Accordingly the following males received 10 rupees each, viz.

1. Ram-tunoo malee, of Intally, for the best Strawberries, though few in number.

2. Gooroo-churun malee, of Mootee-jeel, for very fine Asparagus, 100 heads cut to  $8\frac{1}{2}$  inches weighed 4 lbs. 6 oz.

3. Zarroolla malee, of Allipore.

4. Yusuf malee, of Chitpore.

5. Ram-tunoo, of Intally, Strawberries (best specimen.)

6. Ram-narayun, of Mootee-jeel.

7. Gholam, of ditto.

8. Cashmal malee, of Chitpore, for Strawberries.

FRIDAY, JULY 10, 1827.

At a Meeting of the Agricultural and Horticultural Society held in the apartment of the Asiatic Society.

Proposed by Mr. Gordon and seconded by the Secretary, that gold Medals should be held out for the best Essays presented to the Society on a variety of Agricultural subjects. To be circulated for farther consideration.

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At a Meeting of the Agricultural and Horticultural Society held at the Asiatic Society's apartment, at Calcutta, on Wednesday, 12th September 1827.

The Secretary submitted a schedule of prize essays for which the Society proposed to hold out their gold Medal, founded on a proposal laid before the Society at their last Meeting, and which was ordered to be circulated among their Committee.

Resolved, that the modification and alterations suggested by the Committee be adopted ; and that the Society concur in the opinion expressed by them with reference to the proposition of Mr. H. Wood, (which was likewise submitted at the last Meeting,) for offering premiums for improvements in the breed of cattle and domestic animals, that it appears advisable to postpone for the present all interference in those matters.

Resolved, that the following announcement of the intention of the Society respecting prize Medals be published for general information.

The Agricultural and Horticultural Society with the view of promoting the objects of their institution have resolved to offer their gold Medal for the best essay on each of the undermentioned subjects. In so doing they propose being guided by the same rules as are generally adopted by other Societies on similar occasions ; and they accordingly desire that in the competition, the following conditions may be strictly kept in view.

The Essays may be composed in any known language, but if not in English, they must be accompanied by an English translation. They are to be addressed to the Secretary on or before the 31st December 1828, under a cover inscribed with a motto, or in any other manner that may identify it with a sealed note accompanying it, which is to contain the name and address of the author. No such sealed note will be opened, except for the express purpose of ascertaining the name of the candidate to whom the Medal may have been adjudged. All others together with the essays to which they belong, will at the expiration of the term be restored to their owner, on being inquired after, or ultimately destroyed. No candidate can be permitted to be present at any meeting of the Society, or its committee, assembled to adjudge the merits of their respective essays.

*List of Prize subjects.*

1. Indian Soils, comprizing their analysis and the properties which render certain kinds peculiarly adopted for some, and hostile to other descriptions of cultivation.

2. Manures with an analysis founded on the best and most conclusive experiments, conducted in this country; their adaptation to peculiar soils, and to particular objects of cultivation.

3. Acclimating foreign plants, chiefly those of Europe, the Cape of Good Hope, and New South Wales; with a description of the most successful mode of importing plants, roots and seeds into this country.

4. The cultivation and manufacture of Indigo, with estimates of the produce from a given quantity of land, under different circumstances and in various parts of India.

5. The cultivation of the Sugar-cane and the manufacture of sugar, with detailed estimates.

6. The cultivation of Coffee in Hindoostan founded on a comparison of the practice adopted in other countries with the peculiarities belonging to this part of India; with estimates of the produce, &c.



At a Meeting of the Agricultural and Horticultural Society held at the Asiatic Society's apartments, on Wednesday, 14th November 1827.

Read by the President the following Report on the distribution of the consignment of kitchen garden seeds lately received from Liverpool, and the supplies from Patna and the Neel-giri.

Having been principally instrumental in the distribution of the kitchen garden seeds received from Liverpool by the Society, I am desirous of laying before the present Meeting particulars of that distribution, with a few observations arising out of the subject.

The supply of seeds was comprised in twenty-one boxes, of which nine costing £35 10s. were bought of Mr. Cunningham, and twelve costing £40 were bought of Mr. Johnstone by our friend Mr. Shepherd, Curator of the Liverpool Botanic garden, and the additional expense in boxes, bottles, freight and duty, amounted to £20 more, making the whole cost £95 and a few shillings.

The two supplies appear to have been of equal freshness, and with the exception of one box of Peas, which was a good deal damaged at one end, apparently by damp—they arrived in perfect order.

The supply consisted of seventeen sorts of the cabbage species, including Cauliflowers and Brocoli; four sorts of Lettuce, three sorts of Raddish, four of Onion, one of Celery and Parsley, with nine sorts of Peas, nine sorts of Strawberries, and one of Artichoke.

I received these boxes on Saturday, the 16th September, and on Monday the 18th, gave to Mitchell, our gardener, one-half of Cunningham's supply of seeds, and a supply of Peas also for general distribution among the native males and others agreeing to bring the produce into the market; and on that day and the Tuesday and Wednesday following, fifty-seven different persons were supplied gratuitously, and twenty more up to the 25th September. I do not exactly know the number, but many have been supplied since, more particularly with seeds from the Neel-giri, of which a small

quantity was received by dawk bangy, and portions of which as including Knolcole the natives were very desirous to get.

The Strawberries and Artichoke seeds were reserved for the benefit of the Society, with the exception of small quantities of the Artichoke sent for the general benefit to about thirty different persons in parts of the country where the Artichoke is known to flourish, and to some few gentlemen in Calcutta, particularly attentive to the care of their gardens.

In the distribution of seeds among the members of the Society, I had considerable difficulty in apportioning the quantity to be given to each person. But I ultimately adopted the plan of making the 6th part of a madeira glassful about two tea spoonsful of the smaller seeds, and two quart measures of three kinds of Peas as a share. By the common voice of all who ultimately bought a share of the Society's seeds, the value thereof was 20 rupees. So that at that rate each member has received in seed two-thirds of his annual subscription, and if reference be had to rates commonly paid, each member has received little short of twice his annual subscription.

Several gentlemen agreed with me in thinking the supply sufficient, and after the sale of a proportion of the seeds was agreed, any gentleman wishing more had an opportunity to purchase, of which a few availed themselves.

And at present I think the quantity determined on for each share, to have been as good a one as could have been fixed, for though a large quantity of a few kinds as Onions, Radishes and Drumhead Cabbage might have been given, many more desirable sorts have been long since exhausted and others too are drawing to a close.

Thus, gentlemen, in this way seventy-two parcels of the smaller seeds and four hundred and thirty-two quart measures of Peas have been distributed among the members and for the general purposes of the Society, in which I of course include seeds sent to the hills, to Penang, &c.\* for the general good.

It has always been my anxious wish to make our purchases in England, by the sale of a part to repay their cost, in order not merely to prevent the exhaustion of our funds, but to give the public a benefit, and an interest in our exertions.

This object was amply accomplished by the sale of the grafted fruit trees twice commissioned out by the Society, but it is to be remembered, that on that occasion the members also paid for their trees, which has not been the case with regard to the seeds.

In pursuance of this object, and as soon as I could see my way a little into the probable result, it was resolved in concert with the gentlemen of the garden Committee to sell a portion of the seeds, and I am happy to communicate, that seeds to the value of 720 rupees have been already actually sold, a result which I contemplate with great satisfaction, and which will, I trust, be satisfactory to the Society.

I have no further particulars that I wish to trouble the Meeting with. But I cannot, gentlemen, refrain from congratulating you on our present prospects. The accession of our strength this day speaks volumes. The almost forgotten reminiscence of a few of our members has been awakened. Your investment of seeds was highly productive even before one grain vegetated. The public by being allowed the benefit of our exertions have been made subservient to our views, or to descend a little, we have enjoyed the advantage of their custom.

As long as a similar result can be obtained, our Society must flourish and be productive of great public benefit.

I beg to propose in conclusion, that our best thanks be tendered to Mr. Roscoe and the members of the Committee of the Liverpool botanic garden for their continued attention to our Society; to Mr. Shepherd, who had the trouble of providing and packing our seeds, and also to Captain Atkins, of the Bengal, for the care taken of our investment of seeds on board of his ship.

*List of native Gardeners and others, cultivating for the Calcutta market, who have been supplied gratuitously from the above assortments.*

## LIVERPOOL INVESTMENT.

- |                   |                     |
|-------------------|---------------------|
| 1. Gooroochurun.  | 30. Thakoor-das.    |
| 2. Ramtunoo.      | 31. Gour-das.       |
| 3. Budinatha.     | 32. Goolmahomed.    |
| 4. Huludhur.      | 33. Siddhiram.      |
| 5. Beechuk.       | 34. Eeshwur.        |
| 6. Rughoonatha.   | 35. Meehindec.      |
| 7. Coochil.       | 36. Shureef.        |
| 8. Beechuk.       | 37. Pitumbur.       |
| 9. Jugut.         | 38. Kalceechund.    |
| 10. Radhamohun.   | 39. Huludhur.       |
| 11. Ramhuri.      | 40. Manika.         |
| 12. Kaleechurun.  | 41. Koochil.        |
| 13. Rutachundra.  | 42. Gulabdee.       |
| 14. Komul-das.    | 43. Geer Ulla.      |
| 15. Govurdhun.    | 44. Durrad.         |
| 16. Punchaseen.   | 45. Mootee Ulla.    |
| 17. Ramdhun.      | 46. Gungaram.       |
| 18. Ramprusada.   | 47. Subul.          |
| 19. Bulum-ghosa.  | 48. Busredce.       |
| 20. Neelmunee.    | 49. Ramtunoo.       |
| 21. Kalceprusada. | 50. Soobur.         |
| 22. Kashee-ghosa. | 51. Peeris Oollah.  |
| 23. Mudhoosoodun. | 52. Budinatha.      |
| 24. Eesachundra.  | 53. Raimmohun.      |
| 25. Heerram-das.  | 54. Sureca.         |
| 26. Bausee.       | 55. Cheedam.        |
| 27. Neemee.       | 56. Rammohun-ghosa. |
| 28. Kaleechurun.  | 57. Govurdhun.      |
| 29. Kaleeram.     |                     |

*Supplied from 17th to 19th September, on Monday, Tuesday, Wednesday following the Saturday on which I got the seeds.*

- |             |                 |
|-------------|-----------------|
| 58. Bunkoo. | 61. Binchoo.    |
| 59. Fukeer. | 62. Nidhiram.   |
| 60. Haree.  | 63. Vrindavuna. |

*Supplied on Thursday, 20th September.*

- |                  |                   |
|------------------|-------------------|
| 64. Hafee Ulla.  | 70. Yoosuf.       |
| 65. Gouffer.     | 71. Deb-ghosa.    |
| 66. Iam Mahomed. | 72. Surun-ghosa.  |
| 67. Chedam Alli. | 73. Urjoon-ghosa. |
| 68. Abdulla.     | 74. Gobur.        |
| 69. Rutun.       | 75. Jaloorea.     |

*Supplied Monday, 24th September.*

76. Sustiram.

*Supplied Tuesday, 25th September.*

#### PATNA SUPPLY.

- |                |                   |
|----------------|-------------------|
| 1. Bādiram.    | 9. Rughoonatha.   |
| 2. Rammohun.   | 10. Beechoo.      |
| 3. Gokool.     | 11. Neemoo.       |
| 4. Pitumbur.   | 12. Bungshee.     |
| 5. Ramtunoo.   | 13. Gour.         |
| 6. Huludhur.   | 14. Mudhoo.       |
| 7. Jubul.      | 15. John Fenwick. |
| 8. Ramchundra. |                   |

*Principally supplied with two seers of Peas, one seer of Windsor Beans, two ounces of Cauliflowers, one ounce of Bootan Turnips, and accordingly thirty seers of Peas, fifteen seers of Beans, thirty ounces of Cauliflowers, and fifteen ounces of Bootan Turnips.*

- |                      |                   |
|----------------------|-------------------|
| 16. Eesuf.           | 23. Kalee-das.    |
| 17. Tar Mahomed.     | 24. Deepnarayuna. |
| 18. Gooroprusada.    | 25. Gur Ulla.     |
| 19. Vrindavuna.      | 26. Golabdee.     |
| 20. Mchindee.        | 27. Kouchul.      |
| 21. Suroop.          | 28. Nreloo.       |
| 22. Hi-Burkutt Ulla. | 29. Juynarayuna.  |

- |                  |                      |
|------------------|----------------------|
| 30. Gungaram.    | 40. Gungaram.        |
| 31. Nidhiram.    | 41. Rughdonatha.     |
| 32. Dureep.      | 42. Fukeer-das.      |
| 33. Roopuk.      | 43. Mudun.           |
| 34. Gureeb Ulla. | 44. Nimee.           |
| 35. Haroo.       | 45. Chundraram seel. |
| 36. Nuvakeshuva. | 46. Kashee.          |
| 37. Haroo.       | 47. Gokool.          |
| 38. Busri.       | 48. Mudhoo.          |
| 39. Goukeer.     |                      |

Resolved, unanimously, that the cordial thanks of the Society be communicated to Mr. Shepherd, of Liverpool, and to Capt. Atkins, commanding the Bengal, for their valuable services to which the gratifying results of the Society's endeavours on the occasion of the late importation of kitchen garden seeds is to be entirely attributed.

Resolved, unanimously, that the most cordial thanks of the Society be conveyed to W. Roscoe, Esq. for his unremitting attentions, and for his invaluable co-operation in giving the necessary directions for preparing and transmitting the Society's consignment of seeds, and to the President and Committee of the Liverpool Botanical Institution for their polite attention in consenting to Mr. Shepherd's rendering his services on that occasion.

The President submitted a detailed list of vegetable seeds with a few flower seeds and bulbs which it would be desirable to indent for from Liverpool for the supply of the season of 1828, the cost of which he estimated at about £110.

Resolved that the list be adopted and the Secretary be instructed to address Mr. Roscoe and Mr. Shepherd as on preceding occasions.









